# User Guide

## Tuners

# AVT 200HD

ATSC and Cable TV HD Tuner

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-1834-01 Rev. A
05 11

# Safety Instructions • English

**This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.**

**This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product enclosure that may present a risk of electric shock.**

## Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer instructions.

# Consignes de Sécurité • Français

**Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).**

**Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.**

## Attention

**Lire les instructions•** Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conserver les instructions•** Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Avertissement

**Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

**Déconnexion de l'alimentation•** Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

# Sicherheitsanleitungen • Deutsch

**Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.**

**Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.**

## Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

# Instrucciones de seguridad • Español

**Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.**

**Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.**

## Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

## Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

# 安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

## 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

## 警告

**电源** • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

**拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

**电源线保护** • 妥善布线， 避免被踩踏，或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**NOTE:** This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, **click here**.

## Coaxial Cable

The outer shield of a coaxial cable shall be grounded in accordance with the applicable provisions of the National Electrical Code ANSI/NFPA 70-2005, Article 820, and Canadian Electrical Code, Part 1, Section 54.

## Conventions Used in this Guide

In this user guide, the following are used:

**NOTE:** A note draws attention to important information.

**TIP:** A tip provides a suggestion to make working with the application easier.

**CAUTION:** A caution indicates a potential hazard to equipment or data.

**WARNING:** A warning warns of things or actions that might cause injury, death, or other severe consequences.

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
```

```
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

```
Esc X1 * X17 * X20 * X23 * X21 CE←
```

**NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
```

```
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
```

```
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

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# Introduction

This section gives an overview of the Extron AVT 200HD ATSC and Cable TV HD Tuner and describes its significant features. Topics include:


- **About this Guide**
- **About the AVT 200HD Tuner**
- **Features**
- **Application Diagram**


## About this Guide

This guide contains information about the AVT 200HD tuner with instructions for experienced installers on how to install, configure, and operate the equipment.

In this guide, the terms "AVT," "AVT 200HD," and "tuner" are used interchangeably to refer to the AVT 200HD tuner.

## About the AVT 200HD Tuner

The AVT 200HD is a high performance tuner that receives ATSC over-the-air broadcast signals and delivers high-definition television (HDTV) video simultaneously on HDMI®, RGBHV, and YUV outputs. It outputs pulse code modulation (PCM) stereo or Dolby® Digital surround (AC-3) formatted audio signals with simultaneous S/PDIF digital and analog balanced and unbalanced stereo. The AVT 200HD also provides clear QAM (unencrypted) cable (CATV) decoding and standard definition video outputs. Additional integrator and user-friendly features include a multi-function on-screen display and channel presets.

## Features

Some key features of the AVT 200HD are listed below:

- **Over-the-air (ATSC) and cable (CATV) channel reception** — Delivers high quality HD video broadcasts from over-the-air ATSC, and clear QAM signals from cable. A full range of channels are available:
  - Over-the-air channels: 2 through 69
  - Cable channels: 1 through 135
- **Simultaneous HDMI, RGBHV, and HD component video outputs** — Selectable 480i, 480p, 720p, and 1080i output rates are available.
- **Multiple control options** — Can be configured and controlled through the front panel, an optional IR remote control, or a computer or control system that interfaces with the AVT via RS-232, Ethernet, or the front panel USB port.
- **Multi-function n-screen display** — Provides an interface for the user with information on the currently tuned channel, signal reception strength, and a guide that lists current and upcoming program information.
- **Composite video and S-video outputs** — Can be used for standard definition video display and capture or recording when the AVT is set for 480i output.

- **Preset channel selection** — Frequently tuned channels can be saved and recalled as presets. There are 99 presets available.
- **Audio and video muting** — Audio and video outputs can be muted individually and simultaneously.
- **Aspect ratio control** — Can be set for 16x9 or 4x3 output. A 4x3 image on a 16x9 display and vice versa can be shown with black bars or can be stretched or zoomed to fill the display by changing the output display mode.
- **Image freeze control** — A live image can be frozen through RS-232, Ethernet, or optional IR remote control.
- **Closed captioning** — Closed captioning of broadcasts is available with customization of the appearance and style of the captions, including font type, size, and color.
- **V-chip** — Television programs can be blocked from view based on their movie and TV ratings. V-chip settings can be configured via Extron Simple Instruction Set (SIS™) commands or the Windows®-based configuration and control software.
- **Front panel security lockout (executive mode)** — Locks out front panel functions if needed for security purposes. (All functions remain available through RS-232, IR, or Ethernet control.)
- **Ethernet control** — The AVT 200HD can be controlled, configured, and monitored over a LAN, WAN, or the Internet. In addition, embedded HTML web pages enable you to perform functions such as channel selection, volume control, and system configuration.
- **Windows-based configuration and control software** — The AVT 200HD Configuration & Control Program can be used to configure and control the tuner via RS-232, RS-422, or Ethernet.
- **RS-232 configuration and control** — The AVT 200HD can be controlled and configured via a serial interface using the Extron Windows-based control program or SIS commands.
- **USB configuration and control** — Enables you to configure the AVT via the front panel USB port using SIS commands.
- **HDCP compliance** — Fully supports HDCP-encrypted signals.
- **Rack-mountable** — The AVT can be mounted on a standard 1U, 19-inch (full rack) wide metal rack shelf.
- **Optional IR remote control** — The optional AVT 200HD IR Remote Control (part number **70-743-01**) provides an additional method of controlling the tuner.
- **Internal universal power supply** — The internal 100-240 VAC, 50-60 Hz, international power supply provides worldwide power compatibility.

## Application Diagram

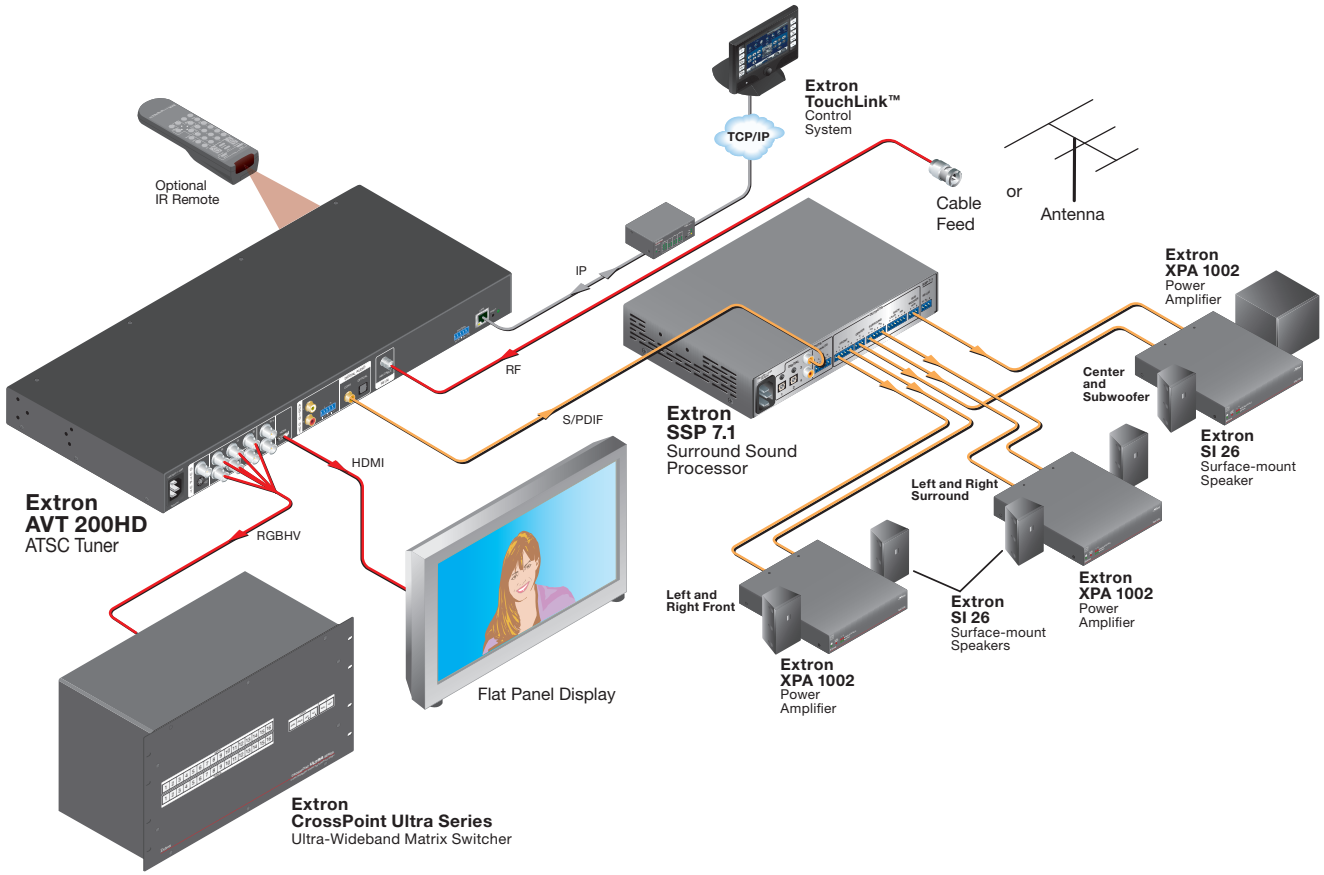



**Figure 1. Application Diagram for the AVT 200HD**

# Installation

This section describes the rear panel of the AVT 200HD and provides instructions for cabling. It covers the following topics:

- **Installation Overview**
- **Rear Panel Features**
- **Control Connections**

## Installation Overview

Follow these steps to install and set up the AVT 200HD tuner:

1. **Disconnect power** from the tuner and turn off all other devices that are connected to it.
2. (Optional) **Mount the unit in a rack.** Rack mount the tuner using the supplied brackets (see the "**Mounting the Tuner**" in the "Reference Information" section).
3. **Connect the RF input.** Connect an antenna or a CATV cable to the RF In F-type connector (⑩ on the **rear panel diagram** on the next page).
4. **Connect the video output.** Connect a television or other output device to one of the following video output connectors:
   - **VID** — Composite video (②, top, on the **rear panel diagram**)
   - **YC** — S-video (②, bottom, on the **rear panel diagram**)
   - **RGBHV** — RGBHV (③ on the **rear panel diagram**)
   - **Component video** — YUVp/HD or YUVi (④ on the **rear panel diagram**)
   - **HDMI** — HDMI digital (⑤ on the **rear panel diagram**)
5. **Connect the audio output.** Connect a speaker set, amplifier, receiver, or other audio output device to one or more of the following connectors:
   - **RCA** — Unbalanced analog (⑥ on the **rear panel diagram**)
   - **Captive screw** — Balanced or unbalanced analog (⑦ on the **rear panel diagram**)
   - **Coax** — Digital S/PDIF (⑧ on the **rear panel diagram**)
   - **Optical** — (Fiber optic) Digital S/PDIF (⑨ on the **rear panel diagram**)
6. **Connect control devices:** Connect your computer to one of these AVT ports to configure and control the tuner via the Windows®-based software or SIS commands.
   - **RS232 port** — Serial RS-232 control (⑪ on the **rear panel diagram**)
   - **LAN Ethernet port** — Ethernet control via Internet browser (⑫ on the **rear panel diagram**)
   - **Config port** — USB connection (② on the **front panel diagram** in the "Operation" section)
7. **Connect power** to the AVT by connecting a standard IEC power cord (provided) from a 100 to 240 VAC, 50-60 Hz power source to the AC power receptacle (① on the **rear panel diagram**).

## Rear Panel Features

All of the AVT 200HD connectors are on the rear panel. The following figure shows the AVT rear panel features.

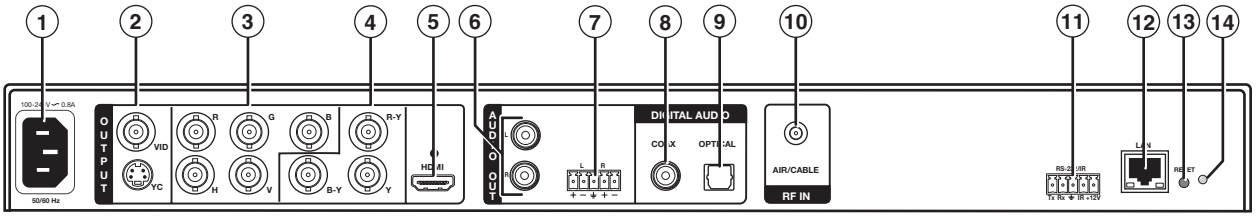



**Figure 2. AVT 200 Rear Panel**

**CAUTION:** Use electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge (ESD) can damage equipment, although you may not feel, see, or hear it.

**WARNING:** Remove power from the system before making any connections.

① **AC power connector** — Plug a standard IEC power cord into this connector to connect the tuner to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

### Video Output Connectors

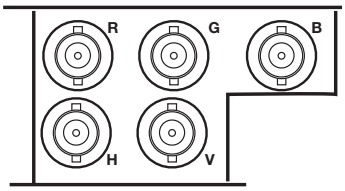
② **Composite and S-video stacked video output connectors** —

- **VID (top):** Connect a composite video output device to this female BNC connector.

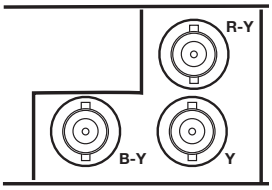
- **YC (bottom):** Connect an S-video output device to this female 4-pin mini DIN connector.

These connectors output simultaneously when the 480i output rate is selected.

③ **RGBHV output connectors** — Connect an RGBHV output device to these five female BNC connectors. This output supports 480i, 480p, 720p, and 1080i resolutions.

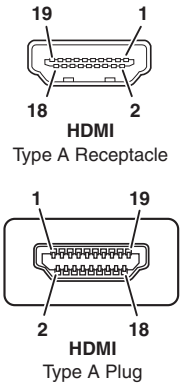



④ **Component video output connectors** — Connect an HD YUV output device to these three female BNC connectors. These outputs support 480i, 480p, 720p, and 1080i resolutions.



⑤ **HDMI video output connector** — Connect an HDMI output device to this female HDMI connector for digital video output. This output supports 480p, 720p, and 1080i resolutions. The table below shows the pin assignments for this connector.

| Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|
| 1 | TMDS data 2+ | 7 | TMDS data 0+ | 13 | CEC |
| 2 | TMDS data 2 shield | 8 | TMDS data 0 shield | 14 | Reserved (NC on device) |
| 3 | TMDS data 2– | 9 | TMDS data 0– | 15 | SCL |
| 4 | TMDS data 1+ | 10 | TMDS clock+ | 16 | SDA |
| 5 | TMDS data 1 shield | 11 | TMDS clock shield | 17 | DDC/CEC ground |
| 6 | TMDS data 1– | 12 | TMDS clock– | 18 | +5 V power |
| | | | | 19 | Hot plug detect |




An Extron LockIt™ cable lacing bracket is provided with the AVT to enable you to secure the HDMI device cable to this output connector to prevent intermittent or complete signal loss due to a loose cable connection. Above the connector is a hole into which an HDMI connection mounting screw (provided) can be inserted to attach the lacing bracket to the AVT rear panel. (See the provided *LockIt HDMI Lacing Bracket Installation Guide* card for information on attaching the bracket.)

**Figure 3. HDMI Connector Pin Assignments**

## Audio Output Connectors

### Analog audio output connectors

⑥ **Audio output RCA connectors** — Connect a speaker set or other audio output device to these RCA connectors for balanced or unbalanced analog audio output.

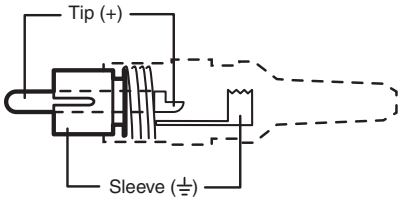



**Figure 4. Wiring an RCA Connector**

⑦ **Audio output captive screw connector** — Connect a speaker set or other audio output device to this 3.5 mm 5-pole captive screw connector for balanced or unbalanced analog audio output (see the illustration on the next page).

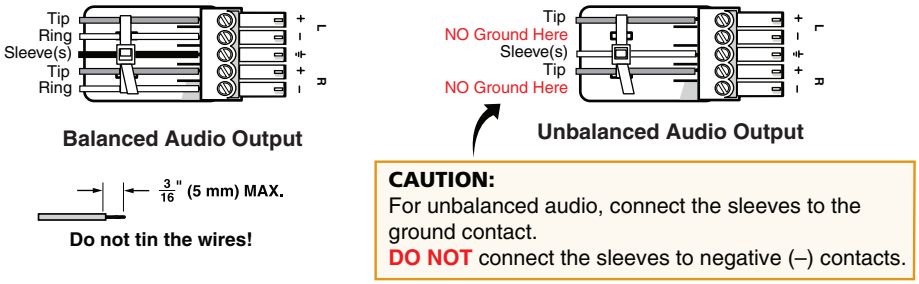



**Figure 5. Wiring the Captive Screw Audio Connector**

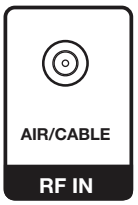
## Digital audio output connectors

Both digital ports support AC-3 and PCM digital audio.

⑧ **Coax port** — Connect a digital audio output device to this coaxial RCA jack for S/PDIF signal transmission.

⑨ **Optical port** — Connect a digital audio output device to this TOSLINK™ fiber optic connector for S/PDIF signal transmission.

## Input Connector




⑩ **Air/Cable RF In connector** — Plug an antenna or a CATV cable into this F-type connector for over-the-air or cable radio frequency (RF) input.

## Remote Configuration and Control Connectors

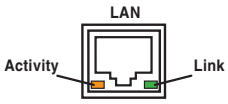
The following connectors are available for remote configuration and control of the AVT 200HD from a computer or other control system or via IR remote control.

⑪ **RS-232/IR connector** — Connect a host device, such as a computer, touch panel control system, or RS-232 capable PDA to this 5-pole captive screw connector for entering SIS commands and using the Windows-based control software (see "**Wiring for RS-232 Control**" later in this section, for information on connecting to this port).

To extend IR control, you can also connect an optional IR Link to this port (see "**Wiring for IR Control**," later in this section).

⑫ **LAN port** — If desired, connect the AVT 200HD to a computer or to an Ethernet LAN via this RJ-45 connector. Through this port, you can control the tuner using SIS commands, the **AVT 200HD Configuration & Control Program**, or the **HTML pages** that are pre-loaded on the AVT (see "**Ethernet Connection**," on the next page).

The two LEDs on this connector indicate the status of the Ethernet connection. The amber activity LED indicates that the RJ-45 connector is transmitting or receiving data. This LED flickers as the tuner communicates. The green link LED indicates that the AVT is properly connected to an Ethernet LAN. This LED lights steadily.




⑬ **Reset button** — This recessed button initiates four reset modes on the AVT 200HD. To select a reset level, use a pointed object such as a small Phillips screwdriver to press and hold the button while the AVT is running or while it is powering up (see "**Resetting from the Rear Panel**" in the "Operation" section).

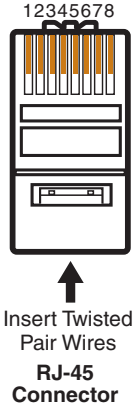
⑭ **Reset LED** — When you are selecting a reset mode, this LED blinks the appropriate number of times to indicate the level of reset or that the reset is complete.

# Control Connections

## Ethernet Connection

When you connect a computer to the AVT 200HD LAN port, it is vital that you use the correct Ethernet cables, and that they are properly terminated with the correct pinout. Ethernet links use Category (CAT) 5 or 5e unshielded twisted pair (UTP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328 feet (100 m).

**NOTES:**
- Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast Ethernet.
- Do not stretch or bend the cables, because this can cause transmission errors.




**Crossover Cable**

| Pin | End 1 Wire color | End 2 Wire color |
|---|---|---|
| 1 | White-green | White-orange |
| 2 | Green | Orange |
| 3 | White-orange | White-green |
| 4 | Blue | Blue |
| 5 | White-blue | White-blue |
| 6 | Orange | Green |
| 7 | White-brown | White-brown |
| 8 | Brown | Brown |
| | T568A | T568B |

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

**Straight-through Cable**

| Pin | End 1 Wire color | End 2 Wire color |
|---|---|---|
| 1 | White-orange | White-orange |
| 2 | Orange | Orange |
| 3 | White-green | White-green |
| 4 | Blue | Blue |
| 5 | White-blue | White-blue |
| 6 | Green | Green |
| 7 | White-brown | White-brown |
| 8 | Brown | Brown |
| | T568B | T568B |

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin or pair assignments are swapped.

**Figure 6. RJ-45 Connector and Pinout Tables**

The cable that you use depends on your network speed. The tuner supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex, Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.

The Ethernet cable must be properly terminated for your application as either a crossover or a straight-through cable.

- **Crossover cable** — Direct connection between the computer and the AVT 200HD
- **Patch (straight-through) cable** — Connection of the AVT to an Ethernet LAN

## Wiring for RS-232 Control

To connect your computer or control system to the AVT RS-232 connector, use an Extron Universal Control cable (UC50' or UC100'; see "**Cables**" in the "Reference Information" section for part numbers) or other female 9-pin-to-bare-wire RS-232 cable.

1. Wire the unterminated end of the RS-232 cable to the 5-pole captive screw connector, provided with the AVT. Use only the first three pins on the connector, starting from the left:
   a. Connect the transmit wire to the first pin on the left, which plugs into the Tx (Transmit) port.
   b. Connect the receive wire to the second pin, which plugs into the Rx (Receive) port.
   c. Connect the ground wire to the third pin, which plugs into the ground port, marked with ⏚.

2. Plug the wired 5-pole connector into the RS-232/IR receptacle on the AVT 200HD rear panel.

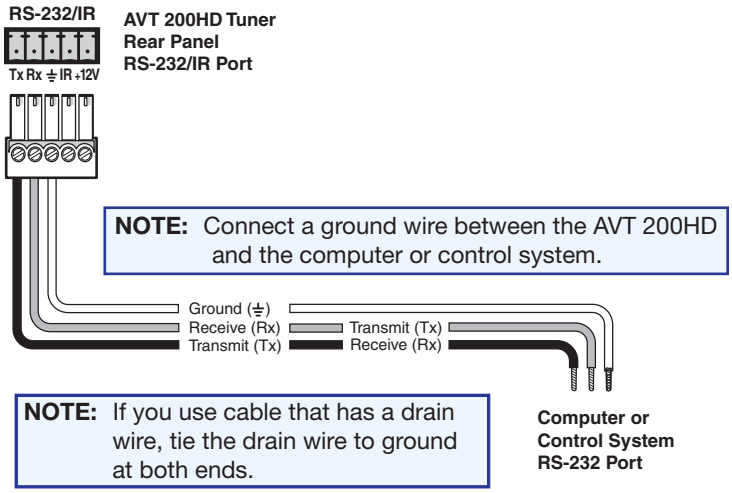

RS-232/IR
Tx Rx ⏚ IR +12V
AVT 200HD Tuner
Rear Panel
RS-232/IR Port
NOTE: Connect a ground wire between the AVT 200HD and the computer or control system.
Ground (⏚)
Receive (Rx)
Transmit (Tx)
Transmit (Tx)
Receive (Rx)
NOTE: If you use cable that has a drain wire, tie the drain wire to ground at both ends.
Computer or
Control System
RS-232 Port

**Figure 7. Remote RS232/IR Connector Pin Assignments**

In the "Remote Configuration and Control" section, see "**Using SIS Commands**" for definitions of the SIS commands and "**Accessing the AVT 200HD Configuration and Control Software**" for details on how to install and use the program.

## Wiring for IR Control

You can control the AVT 200HD by pointing the IR remote control at the front panel IR sensor and pressing the desired button (see "**Using the AVT 200HD IR Remote Control**" in the "Operation" section for more information). However, if the AVT is located where its IR sensor is not in direct line of sight of the remote control, you can connect an IR Link to enable the IR signal from the remote control to reach the AVT.

### Wiring the IR Link

The optional IR Link Infrared Signal Repeater can be connected directly to an AVT 200HD. To wire the IR Link for use with the AVT 200HD:

1. Prepare the site and install a wall box, following the directions in the IR Link user guide, provided with the IR Link equipment.
2. Cut a length of 150 feet (45 m) or less of Extron Comm-Link (CTL or CTLP) cable to go between the AVT and the IR Link.
3. Attach a 3.5 mm, 5-pole captive screw plug (provided) to each end of the cable. Only three wires (between pins A, B, and D on the IR Link end, and the ground, IR, and +12 V pins of the AVT 200HD RS-232/IR connector) are used. Wire the cable as shown below. Connectors are included with the IR Link, but the cable is purchased separately (see "**Cables**" in the "Reference Information" section for cable part numbers).
4. Plug the 5-pole connector into one of the IR Link communication connectors.
5. Connect the other end of the cable to the RS-232/IR port on the AVT rear panel.

**CAUTION:** Do not connect more than one IR Link (in parallel or in series) to the AVT.

The following diagram shows how to wire the AVT 200HD to use the infrared remote control with the optional IR Link.

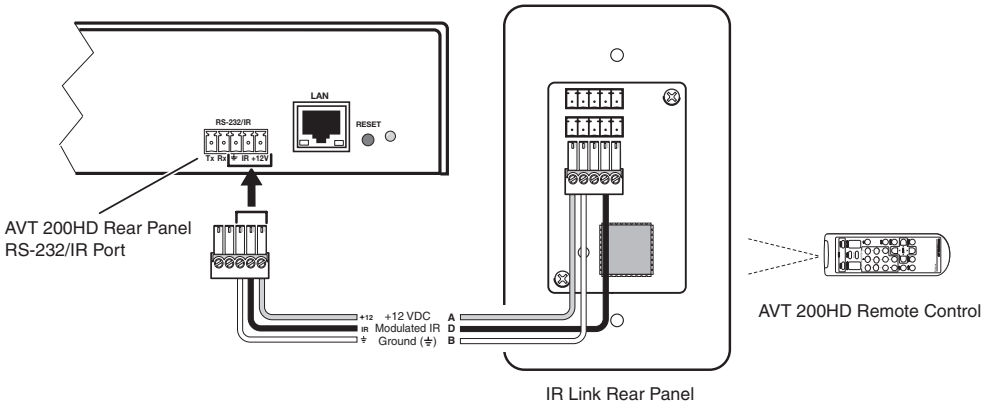



**Figure 8. Connecting the AVT 200HD to the IR Link**

**NOTE:** The ground pin of this connector is shared between RS-232 and IR communication. If using the IR Link, you cannot use this port simultaneously for an RS-232 connection, and vice versa.

## Connecting to the USB Port

The mini Type B USB port is located on the AVT front panel. It can be used to configure the tuner via SIS commands or the Configuration & Control software.

1. Connect a USB A to mini B cable between the USB Config port on the AVT front panel and the USB port on your computer.

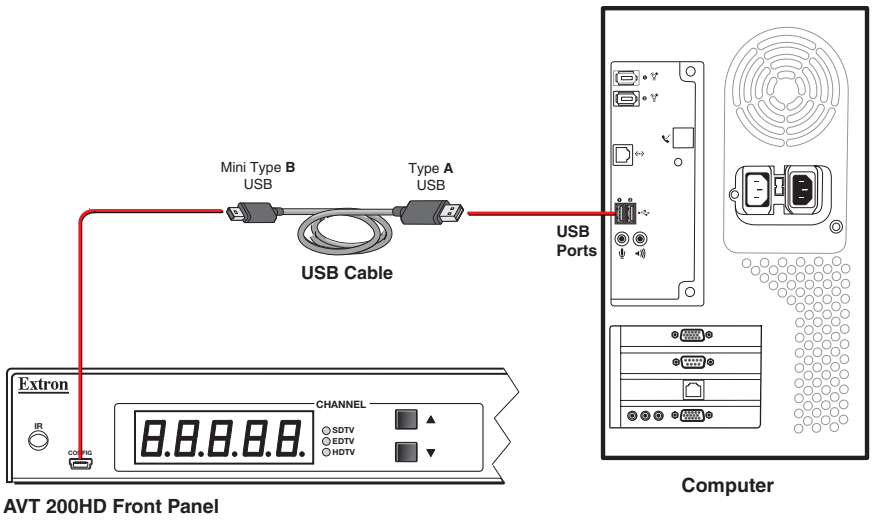



**Figure 9. USB Port Connection**

2. If this is the first time you have connected an AVT 200HD to this USB port on your computer, the Found New Hardware Wizard opens. On the first screen, specify whether you want the computer to connect to Windows Update in order to search the web for the driver that it needs to communicate with the AVT via the USB port. (This is not necessary if the USB driver already exists on your computer.)

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

**Figure 10.** **Found New Hardware Wizard Opening Screen**

- Select the **Yes, this time only** radio button if you want your computer to connect to Windows Update only this one time.
- Select **Yes, now and every time I connect a device** if you want the computer to automatically connect to Windows Update to search the web every time the AVT is connected to this USB port.
- Select **No, not this time** if you do not want the computer to connect to Windows Update to search the web at this time (for example, if the driver is already on your computer).

3. Click **Next**. On the next screen, make sure that the **Install the software automatically (Recommended)** radio button is selected, then click **Next**. (You do not need to insert a disc.)

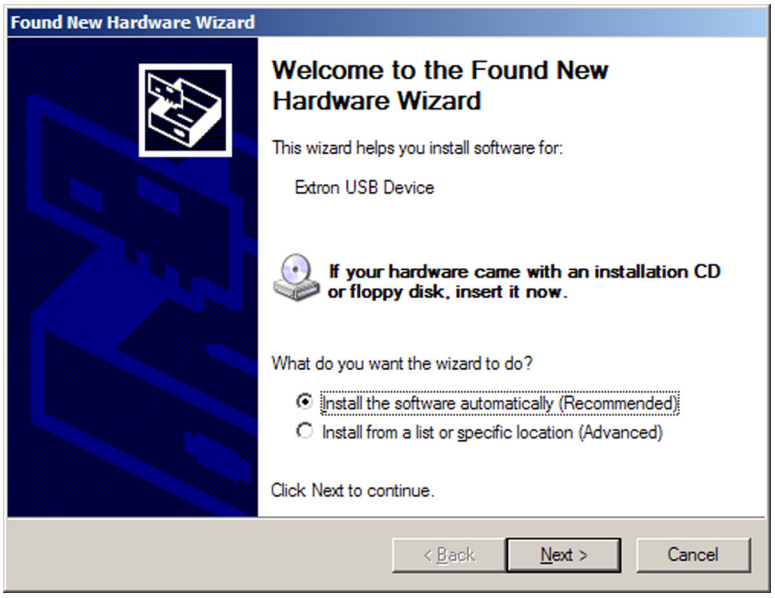

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Extron USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

**Figure 11. Selecting the Radio Button to Install the USB Driver Automatically**

Your computer locates the driver needed for it to communicate with the AVT 200HD via the USB port. This driver is loaded to the computer hard drive when the AVT configuration program is installed.

4. When the Completed screen appears, click **Finish** to close the wizard.

> **NOTE:** This wizard appears only the **first** time you connect the AVT to each USB port. You do not see the wizard again unless you connect the AVT to a different USB port on your computer.

5. Configure the AVT as desired, using SIS commands or the AVT 200HD Configuration and Control Program (see the "**Using SIS Commands**" section for information on available commands, or see the configuration and control program help file).

# Operation

This section describes the AVT 200HD front panel controls and the procedures for using them to configure and operate the AVT tuner. Topics include:

- **Front Panel Features**
- **Powering On**
- **Menus on the LCD Screen**
- **Resetting from the Rear Panel**
- **Locking and Unlocking the Front Panel (Executive Modes)**
- **Using the AVT 200HD IR Remote Control**

## Front Panel Features

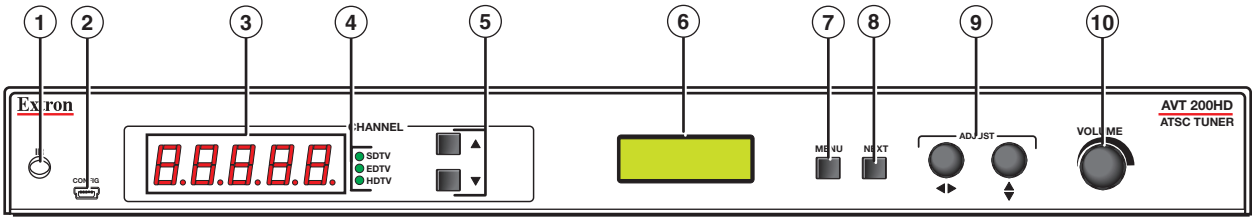



**Figure 12. AVT 200HD Front Panel**

1. **IR receiver** — This sensor receives commands via infrared signals from the optional AVT 200HD IR Remote Control (see "**Using the AVT 200HD IR Remote Control**," later in this section).
2. **Config port** — Connect a USB cable (USB A to mini B) between your computer and this port to configure and control the AVT via SIS commands or the Windows-based configuration and control software, and to update the firmware.
3. **LED display** — This 5-digit, alphanumeric LED display indicates the over-the-air TV or CATV channel being received (in tune mode) or the selected channel preset (in preset mode).
4. **TV format indicator LEDs** — These three green LEDs light to indicate the digital television format of the input signal. The following resolutions are supported:

   SDTV — 480i
   EDTV — 480p
   HDTV — 720p and 1080i

   When no TV signals are detected, none of these LEDs light.

⑤ **Up (▲) and Down (▼) buttons** — These buttons change the channel or preset, depending on the selected operating mode. Each press increments or decrements the number in the LED display (③).

- **In Tune mode (default):** The buttons select channel numbers to switch channels that have saved in the channel list (either manually or by Auto-Scan; see "**Scanning for Channels**," later in this section).
- **In Preset mode:** The buttons select the preset numbers to switch channels that have been saved as presets.

Pressing and holding a button causes the displayed numbers to cycle up or down rapidly. When you release the button, the channel or preset number that appears in the LED display is selected.

⑥ **LCD window** — This window displays messages, menu information, and your menu selections (see "**Menus on the LCD Screen**," later in this section, for information on using the AVT menu system).

⑦ **Menu button** — Press this button to access the AVT 200HD menu system and step through the menus.

⑧ **Next button** — Within a menu, press this button to step through the submenus.

⑨ **Adjustment knobs** — Within a submenu, turn these horizontal and vertical Adjustment knobs to select options from the submenu, such as the output resolution or the RF source (Air or Cable).

⑩ **Volume knob** — Turn this knob to adjust the output volume between 0% (muted) and 100%.

**NOTE:** This knob adjusts volume for analog and PCM digital output only. It does not affect Dolby digital (AC-3) volume.

## HDCP Compliance

When a broadcast flag, indicating protected material, is detected in the television data stream, the LCD screen on the front panel displays an asterisk (*) in the lower-right corner (see the example below).

The AVT 200HD immediately disables any analog video and audio outputs.

For an HDMI connection, the AVT checks the EDID of the connected display and outputs HDMI video or audio only if the monitor is HDCP-compliant.

Analog video and audio resume when the broadcast flag is removed.

**NOTE:** If you not in a position to view the front panel LCD screen, you can check whether the broadcast flag is on or off by entering the SIS command Esc I HDCP←. The system responds with Ø if the broadcast flag is off or 1 if it is on.

See the **View broadcast flag** command in the "Remote Configuration and Control" section for more information.

## Powering On

Apply power by connecting the provided IEC power cord to the rear panel IEC connector and to an AC source. The tuner performs a self-test that flashes the three TV format indicators in order from top to bottom and then turns them off while the initial two power-up screens are displayed in the LCD screen. At the completion of the self-test, the LED display shows the current channel, the appropriate TV format LED is lit, and the LCD window displays the default screen cycle.

If an error occurs during the self-test, the AVT locks up and does not operate. If this occurs, call the Extron S³ Sales & Technical Support Hotline. See the rear cover for **contact information** in your area.

When power is first applied to the AVT, the LCD screen displays `Extron Electronics`, then `AVT 200HD` with the current firmware version. If the AVT self-test completes successfully, the default cycle begins, in which the display alternates between a screen showing the current output resolution and refresh rates and a screen showing the channel to which the AVT is currently tuned. These two screens continue to cycle on the screen when the menu system is not in use.

**NOTE:** Audio and video mute settings are **not** retained when power is cycled to the AVT.

The flow diagram on the next page shows the order in which the screens appear at power-up.

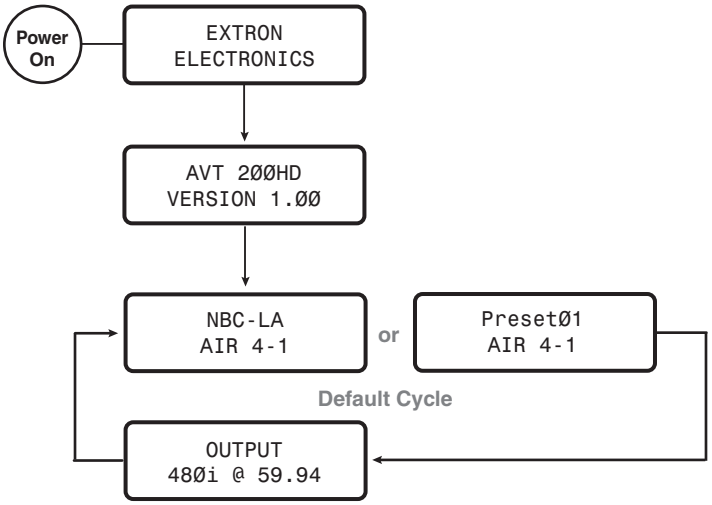
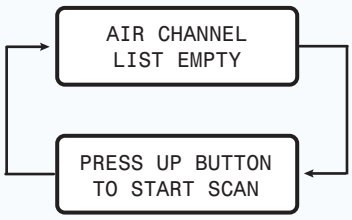



**Figure 13. Power-up and Default Cycle Screens (Example)**

**NOTE:** If your AVT 200HD is new and no channel scan has been performed, the two screens shown at right alternate on the LCD screen instead of the default cycle (see "**Scanning for channels**," later in this section).




This cycle also appears after a system reset (see "**Unit Reset Menu (Resetting from the Front Panel)**," later in this section.) After the first scan the default cycle is displayed after power-up.

# Menus on the LCD Screen

The AVT 200HD menus that are displayed on the LCD screen enable you to configure and operate the tuner from the front panel. The menu navigation buttons (Menu and Next) are located to the right of the LCD window. Press these buttons to cycle through the available menus, submenus, and options.

## Menu System Overview

The menu system consists of five menus, some of which have submenus (see the **menu flow diagram** on the next page).

### Using the menus

Access the different levels of menus using the Menu and Next buttons and the Adjustment knobs as follows:

1. To access the menu system, press the Menu button. The first menu name (`Channel Setup`) is displayed on the LCD screen.
2. Select a menu by repeatedly pressing the Menu button until the desired menu name is displayed.
3. When you see the menu that you want, press the Next button repeatedly to cycle through its submenus.
4. When the desired submenu is displayed, rotate the horizontal (◄►) or vertical (▲▼) Adjustment knob clockwise or counterclockwise to cycle through the submenu options. If you want to return to a menu from within one of its submenus, press Menu.
5. When the desired option is displayed, do one of the following to implement it:
   - Press Next to display another submenu.
   - Press Menu repeatedly until the `Press Next to Exit` screen appears, then press Next to return to the default cycle.
   - Do nothing more, and wait until the LCD screen returns to the default cycle (approximately 30 seconds).

   Your selections are automatically saved.

## Menu flow diagram

The following diagram shows the menus that are displayed in the front panel LCD window and the order in which they appear when you repeatedly press the Menu button.

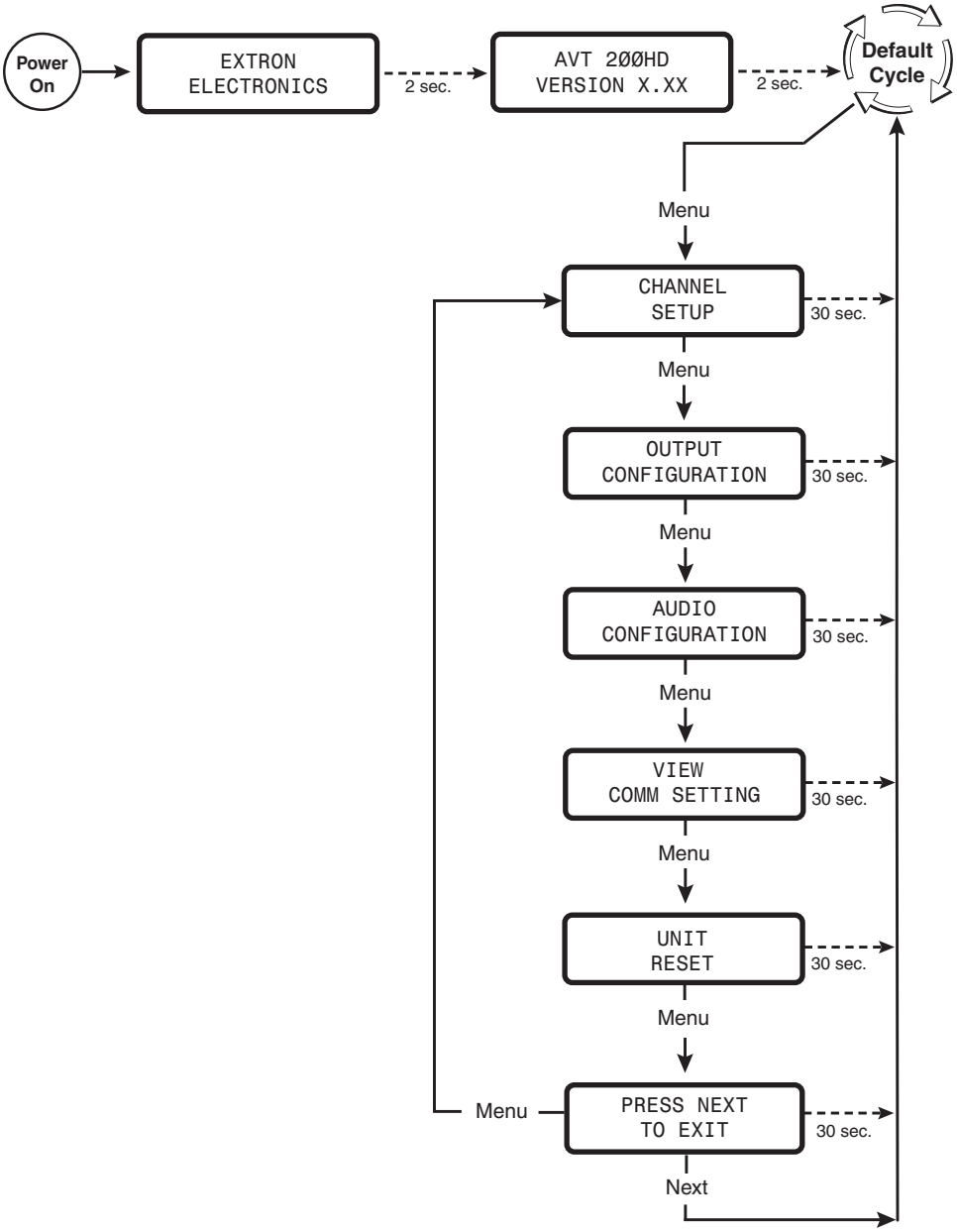



**Figure 14. AVT 200HD Menu Flow**

**NOTE:** The menus time out and the default cycle is displayed after 30 seconds of inactivity; however, any selections you made with the Adjustment knobs are saved and remain in effect until you change them or reset the unit to factory defaults (see "**Unit Reset Menu (Resetting from the Front Panel)**," later in this section).

The following sections describe the submenu options for each of these menus.

## Channel Setup Menu

The Channel Setup menu lets you select the radio frequency source (over-the-air or cable) and to scan for available channels.

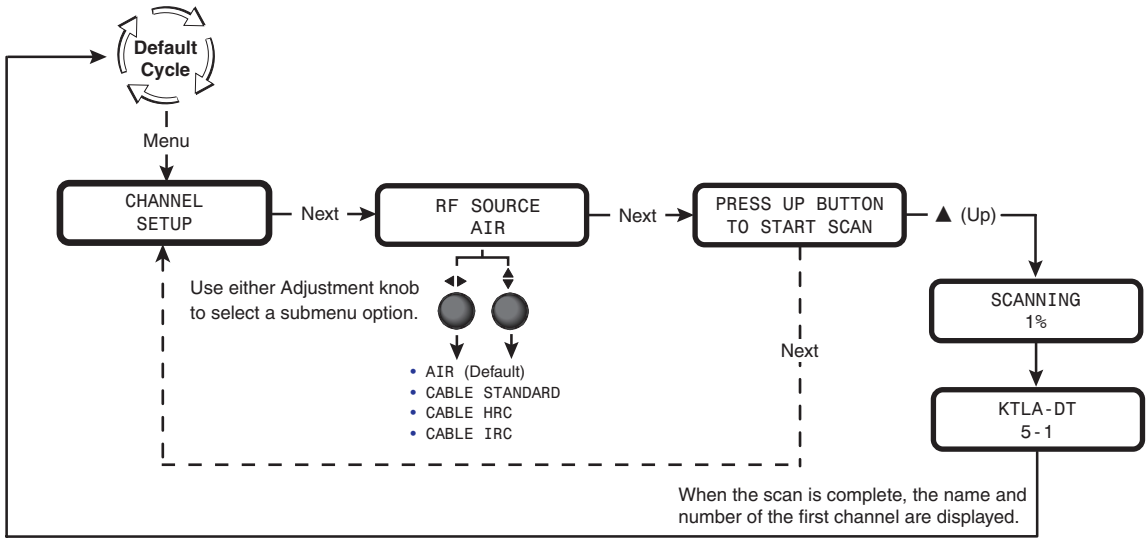



**Figure 15. Channel Setup Menu Flow**

### Selecting the signal source

The AVT 200HD accepts signals over the air or via cable: standard, HRC, and IRC. To select the signal source:

1. Press Menu until `Channel Setup` is displayed in the LCD screen.
2. Press Next once.
3. Turn either Adjustment knob in either direction until the desired source is displayed.

| Option | Scans for |
|---|---|
| `Air` (default) | Over-the-air channels |
| `Cable Standard` | Clear QAM channels in standard cable format |
| `Cable HRC` | Clear QAM channels in HRC cable format |
| `Cable IRC` | Clear QAM channels in IRC cable format |

### Scanning for channels

The AVT 200HD can scan all cable or over-the-air channels and save to memory those with an active signal.

If no channels have been detected and saved, the LED display shows the following:

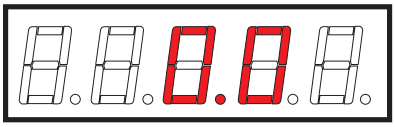


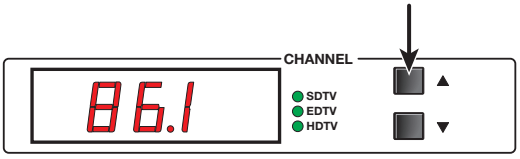
**Figure 16. LED Display with No Channels Scanned**

The LCD screen displays the following:

**Figure 17. LCD Screen with No Channels Scanned**

Follow these steps to scan for channels from the front panel. **The AVT must be in tune mode.** If the desired signal source has already been selected, or if the channel scan is being performed for the first time on this system, skip steps **1** through **3**.

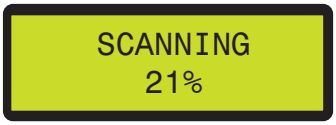
1. Place the AVT in tune mode (see "**Selecting tune or preset mode**," later in this section).
2. Select the signal source from the RF Source menu (see "**Selecting the signal source**," earlier in this section).
3. Press Next until the LCD screen displays `Press Up button to start scan`.
4. Press the Up (▲) button.



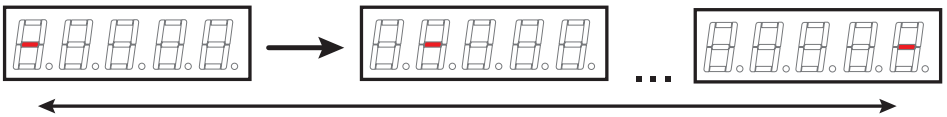

**NOTE:** To stop a scan, press the Menu button. The LCD screen displays `Scanning Stopped` for 2 seconds, then returns to the default cycle.

While the scan is in progress, the following takes place:

- The percentage complete is incremented on the LCD screen. For example:




- On the LED display, a red dash moves back and forth through the digit positions:

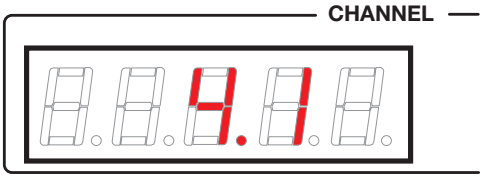


- On the on-screen display, the status bar displays `Channel Scan`, a progress bar, and the number of channels detected.

When the scan is complete:

- **If channels are found and saved,** the LCD screen displays the name and number of the first (lowest-numbered) channel, then returns to the default cycle.

  The first channel number also appears on the LED display. For example:



- **If no channels are found,** the LCD screen displays [*RF source*] CHANNEL LIST Empty, alternating with PRESS UP BUTTON to START SCAN.

  If you want to repeat the scan, press the ▲ button.

  To return to the Channel Setup menu, press the Menu button. (Following a failed scan, the display does **not** automatically return to the default cycle.)

## Channels with long minor numbers

Most cable channel numbers do not exceed 5 digits including both major (preceding the decimal point) and minor (following the decimal point) numbers. However, some cable channels that do not have virtual channel numbers assigned may have 3- or 5-digit minor numbers, making those numbers too large to be displayed on the LED panel. For these numbers, the LED display shows only the last two digits of the minor number, followed by an additional dot.

In the example below, the cable channel number is 128.25018. For this channel, the LED display shows the major number (128) and only the last two digits of the minor number (18). This number is followed by a red dot at the end, indicating that the displayed channel number is a partial one.

**Figure 18. Large Channel Number on LED Display**

To find out the entire channel number, look at the LCD window, which always displays the entire number (with a hyphen [-] in place of the decimal point). The number shown in the figure above would appear on the LCD screen as:

**Figure 19. Large Channel Number on LCD Screen**

## Output Configuration Menu

From this menu, you can set output parameters, including resolution and refresh rate, display aspect ratio, and closed captioning. This menu also enable you to select the operating mode (tune or preset).

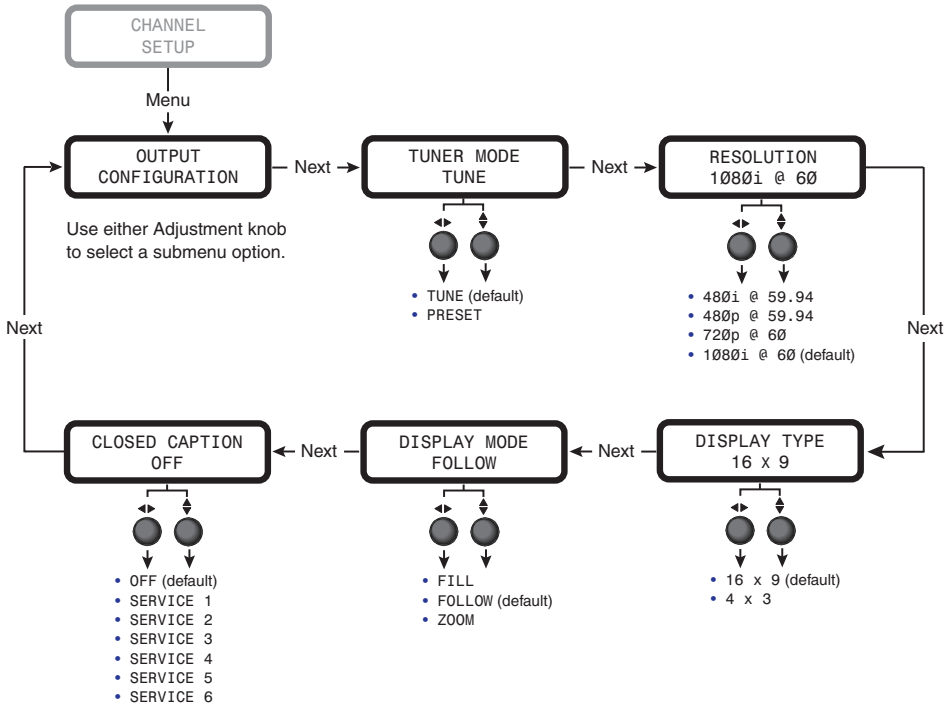



**Figure 20. Output Configuration Menu**

The tasks accessed from the Output Configuration submenus include:

- **Selecting tune or preset mode** (Tuner Mode submenu)
- **Selecting the output resolution and refresh rate** (Resolution submenu)
- **Selecting the display aspect ratio** (Display Type submenu)
- **Selecting the display mode** (Display Mode submenu)
- **Selecting the closed caption service** (Closed Caption submenu)

### Selecting tune or preset mode

The AVT 200HD has two tuning modes: tune and preset. You can use the front panel menus, the Windows-based control software, SIS commands, the embedded web pages, or the AVT 200HD Remote Control to switch between modes.

- **Tune mode:** In tune mode, the Up (▲) and Down (▼) buttons increment and decrement the channel number with each press of the button. If a button is held down for 2 seconds, the channels tune rapidly up or down until the button is released. Tune mode is the default.

  In this mode, you can also do the following:

  - **Scan** for available channels and save them to memory (see "**Scanning for channels**," earlier in this section).
  - **Save** (associate a channel with) a preset. You can do this using SIS commands, the AVT 200HD IR Remote Control, the HTML (web) pages, or the Windows-based control software. **You cannot save a preset from the front panel.**

- **Preset mode:** In preset mode, the Up and Down buttons step up or down through presets that have been saved.

  **NOTE:** Using the front panel, SIS commands, the Windows-based control software, the HTML pages, or the IR Remote Control, you can recall presets in tune mode and preset mode.

To switch between tune and preset modes:

1. From the Output Configuration menu, press Next repeatedly until the LCD screen displays `Tuner Mode`.
2. Rotate either Adjustment knob to select `Tune` or `Preset`.

## Selecting a channel

To tune to a channel, the AVT 200HD **must be in tune mode**.

You can tune using either of the following methods:

- Press the Up or Down button to tune to the desired channel. The current channel number is displayed in the LED display and on one of the default cycle screens.
- Press and **hold** the Up or Down button to cycle rapidly through the channel numbers. When the highest channel number available is reached, the display restarts numbering at the lowest channel number.

**If the AVT 200HD is in preset mode**, you can tune only to a preset channel. To change preset channels, press the Up or Down button to display the numbers of the programmed presets in ascending or descending order in the LED and LCD displays.

If you rerun a channel scan and any different channels are found on the second scan, the channel and preset lists are updated automatically to add new detected channels or remove channels that are no longer available. (To scan for channels, the AVT must be in tune mode.)

If the signal for a channel becomes too weak to be detected, the video output screen displays a "No Signal" message.

## Saving presets (Not available via the front panel)

The AVT 200HD allows 198 programmable presets: 99 for over-the-air and 99 for cable. You cannot **save** a preset using the front panel menu system; you can only **recall** one. You can save a preset using the following methods:

- **SIS commands** (see the **Presets** commands in the Command/Response Table for AVT 200HD SIS Commands, located in the "Remote Configuration and Control" section)
- **The AVT 200HD Remote Control** (see "**Using the AVT 200HD IR Remote Control**," later in this section)
- **The Tuner Settings web page** (see "**Saving a preset**" in the "HTML Configuration and Control" section)
- **The Windows-based configuration and control software** (see the program help)

Only channels that have been found by a channel scan can be saved as presets (see "**Scanning for channels**," earlier in this section).

When a preset is saved, the system gives it the default name "Preset*nn*," where *nn* is the preset number (for example, **Preset01**). You can change this name using the four methods listed above. A preset can have up to 10 characters.

You can also overwrite a preset and save a different channel to its number by using one of the four methods listed above.

## Recalling presets

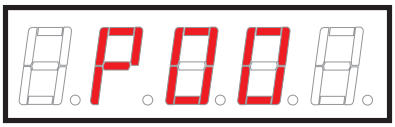
When a channel is saved as a preset, you can tune to that channel by selecting its preset. Using the front panel menus, you can recall a preset that has been saved.

When you select a preset, it recalls the cable or over-the-air TV channel that was programmed for it.

**NOTE:** Channel presets that are programmed while the AVT is in either over-the-air or CATV mode remain exclusive to the mode in which they were saved.

To recall (select and tune to) a preset channel from the front panel:

1. Place the AVT in preset mode.
2. Press the Up (▲) or Down (▼) button repeatedly until the desired preset number is displayed on the LED panel.
   - **If no presets have been saved,** the LED display flashes "P 0 0" for 2 seconds, then returns to the currently selected channel number (or to 0.0 if no channel scan has been performed).

   - **If presets have been saved,** the currently selected preset number is displayed for 2 seconds, then the channel number associated with the selected preset is displayed. The LCD screen displays the preset number (or name, if you defined one using the control software or SIS commands), along with the channel name and number.

     **Example:** If preset 30 is selected via the Up or Down button in Preset mode, the LED and LCD displays show the following:

     After 2 seconds, the digital display shows the channel number (28.1 in this example) associated with preset number 30.

In addition to the front panel buttons, you can use SIS commands (see the "Remote Configuration and Control" section); the control software (see the AVT 200HD control program help file); the AVT 200HD web pages (see "**HTML Configuration and Control**"), or the IR remote control buttons (see "**Using the AVT 200HD IR Remote Control**," later in this section) to recall presets.

## Selecting the output resolution and refresh rate

The following table shows the available resolutions for each video output type. The refresh rate is fixed for each resolution. Multiple output devices can be connected to the AVT if their resolutions are the same. Output sync polarity can be changed by an SIS command (see the **Set output polarity** command in the "Remote Configuration and Control" section) or via the control software (see the control program help file).

| Resolution | Simultaneous Video Output | | | | |
|---|---|---|---|---|---|
| | Composite | S-video | Component | RGBHV | HDMI (with embedded audio) |
| 480i @ 59.94 Hz | X | X | X | X | |
| 480p @ 59.94 Hz | | | X | X | X* |
| 720p @ 60 Hz | | | X | X | X |
| 1080i @ 60 Hz (default) | | | X | X | X |

*480p HDMI output has a 54 MHz pixel clock. Check with the manufacturer of your display to find out if it supports this rate.

To select the output resolution:

1. From the Output Configuration menu, press Next until the LCD screen displays the Resolution submenu screen. **Example:**

   ```
   RESOLUTION
   1080i @ 60
   ```

2. Rotate either Adjustment knob in either direction until the desired resolution is displayed.

   **NOTE:** Each new selection can take up to 20 seconds to be applied.

## Selecting the display aspect ratio

The Display Type submenu lets you select the aspect ratio of the output monitor. The available selections are `16x9` (the default) and `4x3`. From the Display Type submenu, rotate either Adjustment knob until the desired aspect ratio is displayed.

## Selecting the display mode

The Display Mode submenu lets you select the appearance of the image on the display screen. The options are:

- `FILL` — The image fills a 16x9 screen. If the video image is 4x3, it is stretched horizontally to fit the larger screen.
- `FOLLOW` (default) — The aspect ratio of the output image follows that of the source (also called "normal" mode).

  A 4x3 video image is framed to a 16x9 display area, retaining its original aspect ratio but with vertical black bars on both sides of the screen. A 16x9 image is framed to a 4x3 area, with its original aspect ratio but with horizontal black bars at the top and bottom of the screen.
- `ZOOM` — The image is evenly stretched both horizontally and vertically, until the picture fills the entire width of the screen.

The figure on the next page shows how the display appears in each mode for the two display formats.

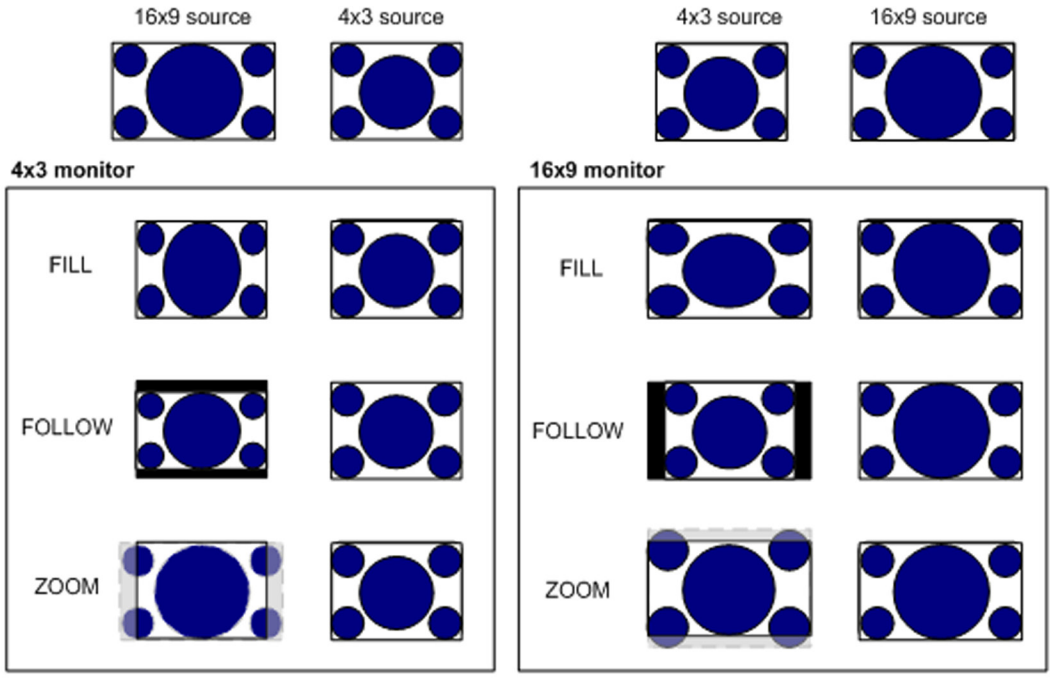



**Figure 21.** Display Modes for 4x3 and 16x9 Monitors

### Selecting the closed caption service

The Caption submenu lets you enable closed captioning and select a service. The options are `Off` (the default) or `Service 1` through `Service 6`. Primary captioning service is provided on Service 1 and secondary service, on Service 2. Services 3 through 6 can be used for additional closed captioning if it is available.

## Audio Configuration Menu

This menu enables you to select the digital audio output type and to specify the language for a second audio program if the channel supports it.

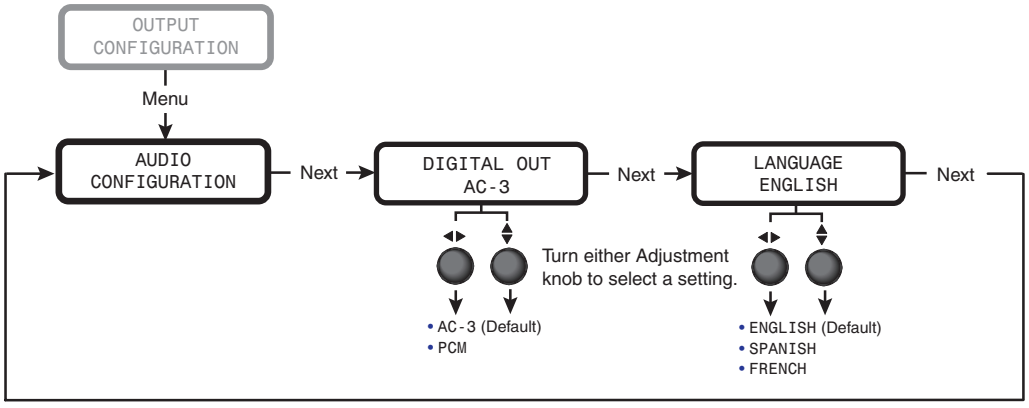



**Figure 22.** Audio Configuration Menu

The following functions are available via the Audio Configuration submenus:

- **Selecting the digital audio type** (Digital Out submenu) — Select the type of digital audio output. The options are `AC-3` (Dolby digital surround, the default) or `PCM` (standard digital audio).
- **Selecting a second language** (Language submenu) — Select the language for a second audio program (SAP), such as a second language or descriptive video service (DVS), if the channel supports it.

## Comm Setting Menus

Use the View Comm Setting and the Edit Comm Setting menus to view and edit the serial communication port configuration and the IP addresses.

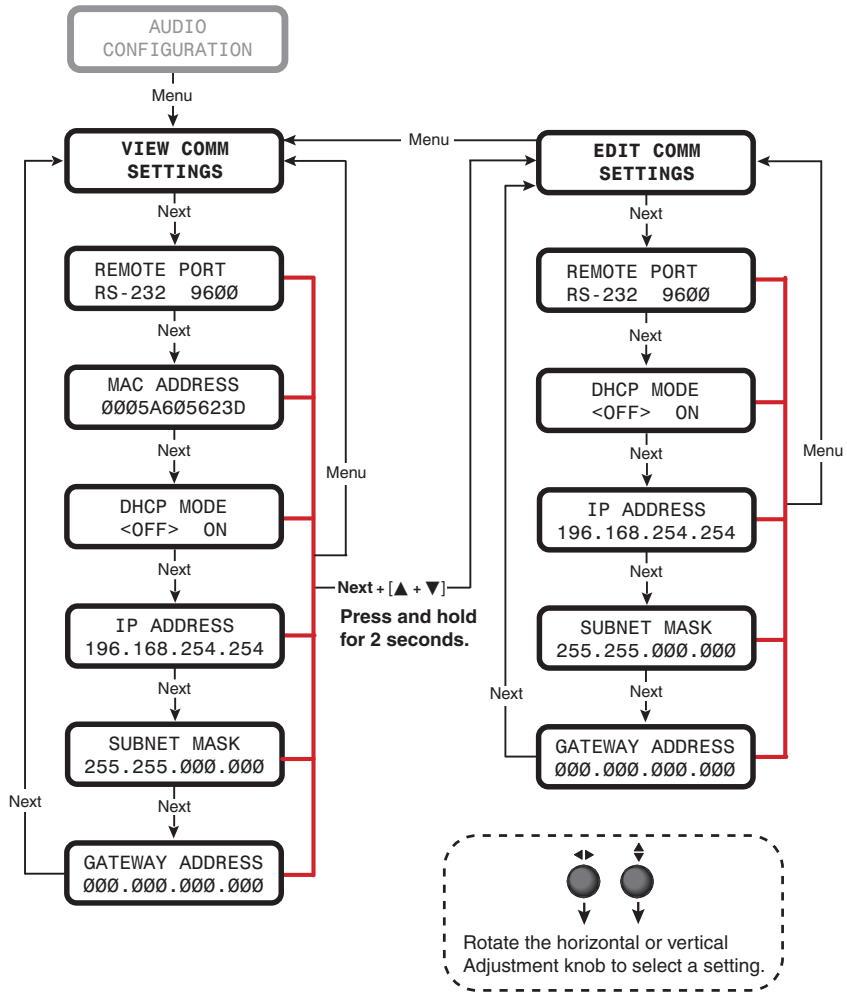



**Figure 23.** Comm Setting Menu Flow

## Viewing serial port and IP settings

The View Comm Setting menu appears after the Audio Configuration menu as you press the Menu button to cycle through the menus. All the View Comm Setting screens that you cycle through by pressing Next show the current settings. **You cannot make changes from these screens.**

To view the current port settings:

1. Press Menu repeatedly until the View Comm Setting menu is displayed on the LCD screen.
2. Press Next repeatedly to cycle through the screens displaying the current settings for the serial port baud rate, MAC address, DHCP mode, IP address, gateway address, and subnet mask.
3. Press Menu to return to the View Comm Setting screen.

## Configuring the serial port and IP parameters

To make changes to the serial port configuration, IP address, DHCP mode, gateway address, or subnet mask, access the edit level screens as follows:

1. With any View Comm Setting menu screen displayed, press and hold the Next button and, while holding the Next button, press the Up (▲) and Down (▼) buttons simultaneously until the Edit Comm Setting menu appears (approximately 2 seconds).
2. Press Next repeatedly to cycle through the Edit Comm Setting screens. When a new screen is displayed, the currently selected item either blinks or is surrounded by angle brackets (< >).
3. To enter or change information on each screen, rotate the horizontal Adjustment knob (◀▶) to move the blinking or the angle brackets to the desired setting. Rotate the vertical Adjustment knob (▲▼) to change the setting.
4. When finished editing the settings for the selected item, do one of the following:
   - Press Next to go to the next editing screen.
   - Press Menu once to return to the Edit Comm Setting menu.
   - Press Menu twice to exit editing mode and go to the View Comm Setting menu.

The following screens can be edited:

- **Remote Control RS-232:** Select the baud rate. The available rates are `9600` (the default), `19200`, `38400`, and `115200`.
- **DHCP Mode:** Set DHCP (Dynamic Host Configuration Protocol) to `On` or `Off`. When DHCP is on, the AVT obtains its IP address from the local network; you do not set the address.

  **NOTE:** DHCP must be **off** before you can edit the IP, subnet, and gateway addresses. If DHCP is on, the three address screens are not displayed.

- **Addresses:** To change these addresses, rotate the horizontal Adjustment knob to select one of the octets and the vertical Adjustment knob to increment or decrement the selected number (`0` through `255`).
  - **IP Address:** Set the IP address. The default address is `196.168.254.254`.
  - **Subnet Mask:** Set the subnet mask address. The default is `255.255.000.000`.
  - **Gateway Address:** Set the gateway address. The default is `000.000.000.000`.

  **NOTE:** These address screens do not appear in the Edit menu if DHCP is on.

## Unit Reset Menu (Resetting from the Front Panel)

Three modes of reset can be initiated from the AVT 200HD front panel.

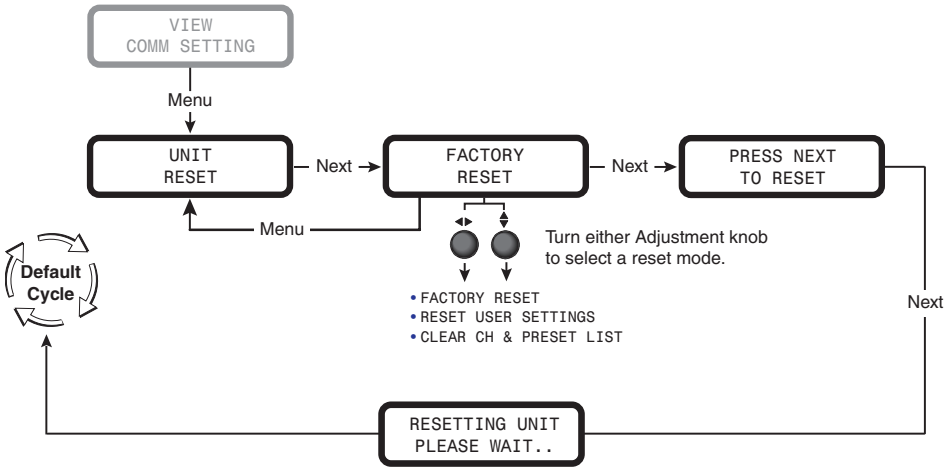



**Figure 24. Unit Reset Menu Flow**

To reset the unit using the front panel menus:

1. Press the Menu button repeatedly until `Unit Reset` is displayed on the LCD screen.
2. Press Next to go to the Unit Reset submenu.
3. Rotate either Adjustment knob to display the reset options:
   - **`Factory Reset`:** Restores all settings to the defaults that were set at the factory **except** the IP settings. (This selection is equivalent to the SIS command Esc ZXXX; see the **Total reset** command in the "Command/response Table for SIS Commands," "Remote Configuration and Control" section.)
   - **`Reset User Settings`:** Resets all settings except the scanned channels and presets.
   - **`Clear Ch & Preset List`:** Erases scanned channels and presets.
4. When the desired reset option is displayed on the LCD screen, press Next. The LCD screen displays `Press Next to Reset`.
5. Press Next to start the reset. While the unit is being reset, the LCD screen displays `Resetting Unit Please Wait`.

   When the reset is complete, the LCD display returns to the default cycle if the channel list has not been removed. If the channel list has been deleted, the *`[Source]`* `Channel List Empty` and `Press Up Button to Start Scan` messages alternate on the LCD screen.

**NOTE:** You can perform resets using:

- The Reset button (see "**Resetting from the Rear Panel**," later in this section)
- SIS commands (see the **Resets** commands in the "Remote Configuration and Control" section)
- The Windows-based control software (see the program help file)

### Exiting the Menu System

To exit the menu system and return to the default cycle, do either of the following:

- Press the Menu button repeatedly until `Press Next to Exit` is displayed on the LCD screen, then press Next.
- Do not press any button. After approximately 30 seconds, the default cycle starts on the LCD screen.

## Volume Control

Rotating the Volume knob on the front panel increases and decreases the audio volume in up to 100 steps. When this knob is turned, the LCD window displays a bar graph representation of the volume level for 0.3 seconds before returning to the previous menu. In addition, the volume percentage is displayed in the upper-right corner of the LCD screen.

**Figure 25. Example of the LCD Screen during Volume Adjustment**

Volume adjustment can be made from the front panel at any time during tuner operation.

## Resetting from the Rear Panel

The rear panel contains a recessed Reset button that initiates four levels of resets. To select a reset level, use a pointed object such as a small Phillips screwdriver to press and hold the button while the tuner is running (modes 2 through 4) or while you are applying power to it (mode 1). The adjacent Reset LED provides feedback on the current reset mode.

The table on the next page provides a summary of the four reset modes.

**CAUTION:** Review the reset modes carefully. Using the wrong reset mode could result in unintended loss of flash memory programming, port reassignment, or a tuner reboot.

**NOTES:**
- The reset modes are separate functions, not a continuation from mode 1 to mode 5.
- There is no reset mode 2 for the AVT 200HD.

| Reset Modes Summary | | | |
|---|---|---|---|
| **Mode** | **Activation** | **Result** | **Purpose/Notes** |
| **1** | Hold in the Reset button while applying power to the tuner. | Restores the factory-installed firmware. All user settings and files, such as audio adjustments and IP settings, are retained. Event scripts do not run when the tuner is powered on in this mode. | Mode 1 can be used to remove a version of firmware if compatibility issues arise. |
| **3** | Hold in the Reset button until the Reset LED blinks once (after approximately 3 seconds); then within 1 second press Reset momentarily (for less than 1 second). | Turns events on and off. During resetting, the Reset LED flashes two times if events are starting or three times if events are stopping. | Mode 3 is useful for troubleshooting. |
| **4** | Hold in the Reset button until the Reset LED blinks twice (once after approximately 3 seconds and again after 6 seconds); then within 1 second press Reset momentarily (for less than 1 second). | • Enables ARP capability.<br>• Sets the IP address, subnet address, and gateway address to the factory defaults.<br>• Sets port mapping to the factory default.<br>• Turns DHCP off.<br>• Turns events off.<br>The Reset LED flashes four times in quick succession during the reset. | Mode 4 enables you to set IP address information using the ARP command and the MAC address. It does **not** replace any user-installed firmware. |
| **5** | Hold in the Reset button until the Reset LED blinks three times (once after approximately 3 seconds, again after 6 seconds, and then again after 9 seconds); then within 1 second press Reset momentarily (for less than 1 second). | Performs a complete reset to factory defaults (except the firmware):<br>• Does everything mode 4 does.<br>• Resets almost all real time adjustments:<br>  • Clears the channel list, all presets, and audio settings.<br>  • Resets all IP options.<br>  • Clears all files from the tuner.<br>The Reset LED flashes four times in quick succession during the reset. | Mode 5 is useful if you want to start over with configuration and uploading and also to replace events. |

## Locking and Unlocking the Front Panel (Executive Modes)

To prevent access by unauthorized users or accidental changes to the AVT 200HD settings, you can lock most of the front panel controls by using executive modes. (The rear panel RS-232 and LAN ports and the front panel USB Config port remain accessible in all executive modes).

You can also select executive modes via the serial or LAN ports by using the SIS commands (see the **executive mode commands** in the "Remote Configuration and Control" section), the Windows-based control software (see the program help file) or the web pages (see "**Tuner Settings Page**" in the "HTML Configuration and Control" section).

The AVT 200HD has four types of security lock that set limits for operation of the tuner from the front panel:

- **Disable mode (default)** — The front panel is completely unlocked (executive mode is disabled). All front panel functions are available.

  To unlock the front panel, press the Menu and Next buttons simultaneously and hold them until the following message is displayed on the LCD screen (approximately 2 seconds):

- **Complete mode** — All functions are locked from the front panel except for disabling executive mode. SIS commands, the configuration and control software, the HTML pages, and the IR remote control remain available.

  Any attempt to enter a command from the front panel results in the following message displayed on the LCD screen for 2 seconds:

- **Volume only mode** — Locks all front panel operations except volume adjustments.

  Any attempt to enter a command from the front panel results in the following message displayed in the LCD screen for 2 seconds:

- **IR Lockout mode** — Locks out all IR access. The AVT IR remote control does not communicate with the tuner when the AVT is in this mode. All other front panel functions are available.

  Any attempt to enter a command from the front panel results in the following message displayed in the LCD screen for 2 seconds:

You can access the Exec Mode Select menu when any other menu or submenu is displayed. To select an executive mode:

1. Press the Menu and Next buttons simultaneously and hold them until the LCD window displays the `Exec Mode Select` menu with the name of the current executive mode (approximately 3 seconds).
2. Rotate either Adjustment knob until the desired mode name appears in the LCD window.
3. Press the Menu or Next button to return to the default cycle or wait for the LCD display to time out.

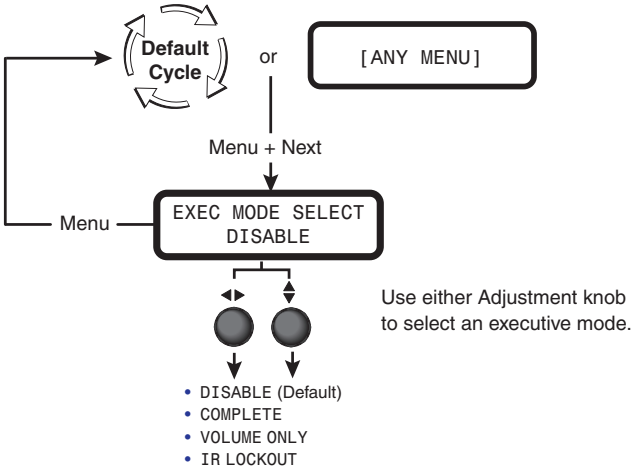



**Figure 26. Executive Mode Menu Flow**

## Using the AVT 200HD IR Remote Control

The optional hand-held AVT 200HD IR Remote Control lets you remotely perform many of the functions that are also available through the front panel, SIS commands, the Windows-based control software, or the embedded web pages. The AVT responds to commands from the remote control as if the corresponding front panel button were pressed or the corresponding SIS command or software selection were entered.

From a distance of no more than 30 feet (9.1 m), the remote control sends infrared (IR) signals to the AVT 200HD through the infrared remote sensor, located on the front panel to the left of the LED channel display. The IR sensor can receive the signal if it is sent from within a 40 degree arc to the right or left of direct line of sight between the remote control and the AVT receiver. See the diagram on the next page.

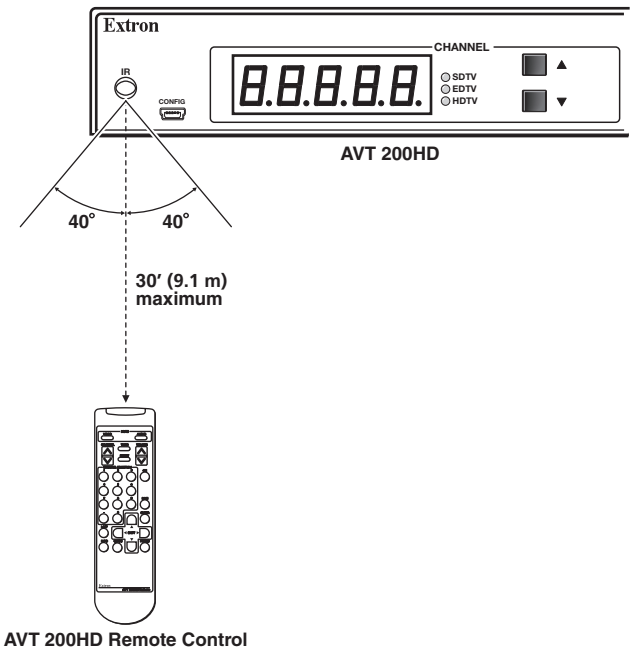



**Figure 27. Area for Remote Signal Reception**

**NOTES:**
- The AVT must be connected to power before you operate the remote control.
- Setup operations cannot be performed from the remote control.

## Installing batteries in the AVT 100 Remote

Install two AAA batteries in the AVT 200HD Remote Control as shown below.

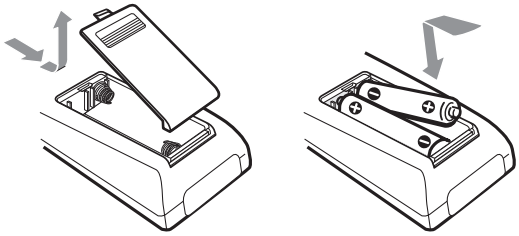


**Figure 28. Installing Batteries in the AVT 200HD IR Remote Control**

## Buttons on the AVT 200HD Remote Control

The following functions are available through the buttons on the AVT 200HD IR Remote Control:

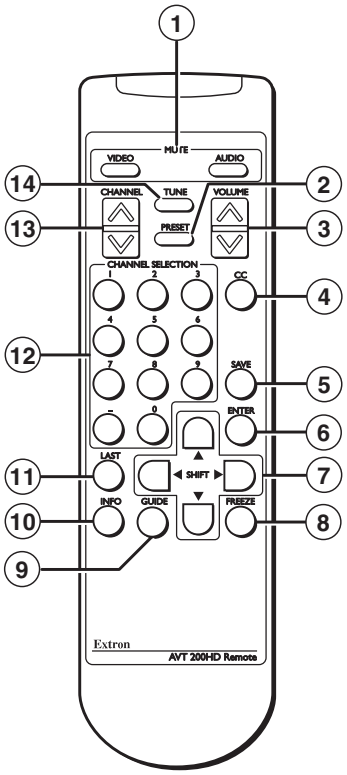



**Figure 29. Buttons on the AVT 200 Remote Control**

① **Video and Audio Mute buttons** — Toggle video and audio output muting on and off.

- When the channel is changed, the video is unmuted.
- When the volume is adjusted, the audio is unmuted.

② **Preset** — Puts the AVT in preset mode. In preset mode, the Channel Selection buttons (②) switch between preset channels.

③ **Volume** — Press the top (up arrow) or bottom (down arrow) section of this rocker button to raise or lower the output volume.

④ **CC** — Selects a closed captioning service (CC1 through CC6) or turns it off.

⑤ **Save** — In tune mode, saves the currently selected channel as a preset. (Presets cannot be saved while the AVT is in preset mode.)

⑥ **Enter** — After using the numbered selection buttons (⑫) to select a channel or preset number, press this button to switch to that channel or preset.

⑦ **Shift buttons** — After the Guide button (⑨) is pressed:

- **The up and down arrow buttons** step through the program menu on the on-screen display.
- **The left arrow button** lets you back-space and delete numbers that you entered on the LED panel by pressing the channel selection buttons (⑫). This button **does not** delete numbers after you press the Enter button to confirm your selections.
- **The right arrow button** is reserved for future use.

⑧ **Freeze** — Freezes and unfreezes the video output.

⑨ **Guide** — Toggles the on-screen Program Guide (list of programs currently available on the selected channel) on and off.

⑩ **Info** — Turns on the on-screen display with information on the current channel. (This button does not turn the display off; after approximately 3 seconds, the OSD turns off automatically.)

⑪ **Last** — Tunes to the previous channel.

⑫ **Channel Selection buttons (0 through 9)** —

- **In tune mode**, press these numbered buttons to specify a channel number.
- **In preset mode**, press these buttons to specify a preset number.

After selecting a channel or preset number, press Enter (⑥) to confirm your selection.

⑬ **Channel** — Press the up and down arrows on this rocker button to increment or decrement the channel number (in tune mode) or the preset number (in preset mode). Pressing and holding this button causes the AVT to cycle rapidly through the channels or presets until the button is released.

- **In tune mode**, pressing either part of this button displays the adjacent channel number. If a channel scan has been performed, pressing the Channel button causes the display to cycle through the channels that were set by the scan for the signal source (over-the-air or cable) in which the scan was done. In this case, the adjacent channel may not be available for display.
- **In preset mode**, the next or previous preset channel is displayed, depending on which part of the button you pressed. The LED panel briefly displays the preset number preceded by a "P," then it displays the channel number associated with that preset.

  If no presets have been defined when the Channel button is pressed, the LED display shows "P00," then the channel number to which the AVT was set before entering preset mode.

> **NOTE:** The Channel button applies to both ATSC and cable modes. See "**Selecting the signal source**," earlier in this section, to switch between these sources.

⑭ **Tune** — Press this button to switch to tune mode. In tune mode, the Channel buttons switch between channel numbers.

## Selecting a Channel or Preset Using the IR Remote Control

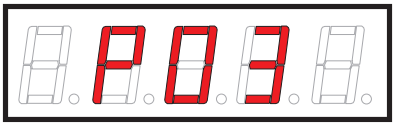
To select or change a channel or preset using the AVT 200HD IR Remote Control:

1. Using the channel selection number buttons, enter each digit of the desired channel or preset number. For channel selection, use the hyphen (–) button to indicate the decimal point separating the minor numbers from the major numbers.

   **Example:** To select channel 53.4, press the buttons numbered 5, then 3, then **–**, then 4.

   The front panel LED display shows the following:

   - **In tune mode:** The channel numbers you pressed, aligned with the **left** edge of the field
   - **In preset mode:** The letter **P** followed by the preset number you pressed, aligned with the **left** edge of the field (see the **example** on the next page).




2. Press the Enter button to implement the channel or preset selection.

   - If the number you entered is a valid channel or an existing preset number, the AVT switches to it, and the number is displayed on the LED panel, aligned with the **right** position in the field (shown in the example below).

     The default cycle on the LCD screen displays the new channel number with a hyphen instead of a decimal point (shown in the example below).

   - If you enter an invalid channel or preset number, the LED display blinks three times, then returns to the channel number that was displayed previously (the display on the LCD does not change). The channel or preset is not changed.

### Locking IR Remote Control Access

The AVT 200HD Remote Control can be set to lock out users from using it to control the AVT. This is done by selecting the `IR LOCKOUT` from the front panel Exec Mode Select menu (see "**Locking and Unlocking the Front Panel (Executive Modes)**," earlier in this section); SIS commands (see the **executive mode commands** in the "Remote Configuration and Control" section); the web pages (see "**Tuner Settings Page**" in the "HTML Configuration and Control" section); or the Windows-based control software (see the program help file). When remote control is locked, all other AVT 200HD controls remain available (SIS commands, the web pages, the control software, and the front panel).

## Using the On-screen Display (OSD)

The AVT 200HD provides a translucent on-screen display (OSD) on which you can view program information for the current channel or the volume level.

**NOTE:** The OSD screens are for viewing only. You cannot make selections from them.

### Introductory Display

Whenever you change a channel, a translucent display pops up on the television screen, showing the following information:

- Channel number
- Channel name
- Program title
- Time of day
- Signal strength

This same display appears when you power on the AVT if it is connected to a display that is already powered on. You cannot disable this introductory display. After approximately 5 seconds, the display disappears.

In the example on below, the current channel is **4.1** (on the OSD, the decimal point is shown as a hyphen); the channel name is **NBC–4LA**; the title of the program currently running is "**Today**"; the time is **1:37 pm**; and the signal strength (shown by a vertical bar graph above the time) is **medium**.

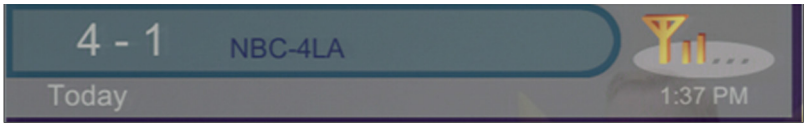



**Figure 30.** **Introductory Channel Display Example**

## Channel Information Display

The channel information display is a translucent window similar to the introductory channel display. It contains all the information that is in the introductory display plus the channel resolution, the language in which the current program is being broadcast, the program rating (G, TV-PG, TV-14, and so on), and whether or not closed captioning is on.

You can enable the OSD displays using the IR remote control (see the "⑩ **Info**" button description under "Buttons on the AVT 200HD IR Remote Control," earlier in this section), the configuration and control software (see the program help file), or SIS commands (see the "**On-screen display (OSD)**" commands in the "Remote Configuration and Control" section). The channel information is displayed for approximately 3 seconds, then the window closes.

In the following example (read left to right), the current channel is 5.1; the channel name is KTLA-DT; the broadcast resolution is 1080i; the signal strength is medium, the program being broadcast is "Jerry Springer"; the time is 1:45 pm; the program is in English; closed captioning (CC) is enabled, and the program rating is TV-14.

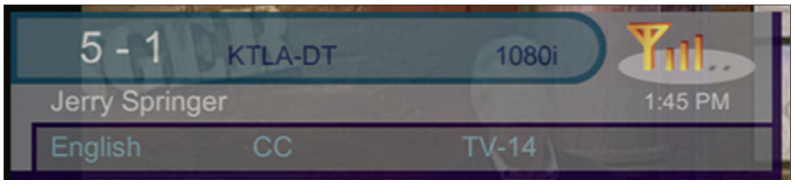



**Figure 31.** **Channel Information Display Example**

## Volume Level Display

Whenever the volume is adjusted by any method, the volume level display is shown on the screen for approximately 3 seconds.

**Figure 32.** **Volume Level Display on the OSD**

Unlike the volume display on the LCD screen, this on-screen display shows the volume increase or decrease in increments of 5% (20 steps). (Volume adjustments that are made using the front panel knob, the communication and control software, or SIS commands are displayed in the LCD window and on the computer screen in 1% increments [100 steps].)

**Figure 33.** **Volume Display on the LCD Screen**

# Program Guide

The translucent program guide display provides a list of the programs available on the current channel for the day.

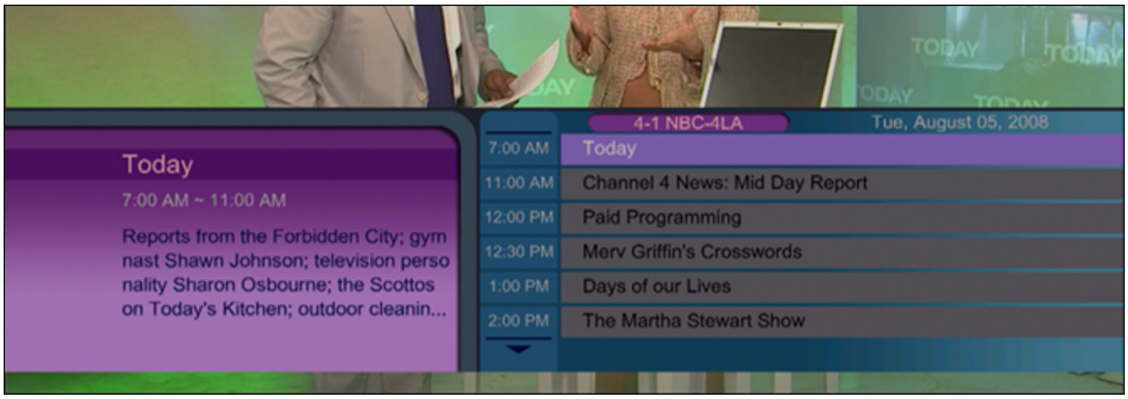

Today
7:00 AM ~ 11:00 AM
Reports from the Forbidden City; gym nast Shawn Johnson; television perso nality Sharon Osbourne; the Scottos on Today's Kitchen; outdoor cleanin...
4-1 NBC-4LA
Tue, August 05, 2008
7:00 AM Today
11:00 AM Channel 4 News: Mid Day Report
12:00 PM Paid Programming
12:30 PM Merv Griffin's Crosswords
1:00 PM Days of our Lives
2:00 PM The Martha Stewart Show

**Figure 34.** Program Guide Example

- **To display the program guide**, do any of the following:
  - Press the Guide button on the IR remote control.
  - Click the **`Prog Guide ON`** button on the **`Control`** tab of the **Configuration & Control Program**. The button turns green when the Program Guide is enabled.
  - Click the **`Program Guide On`** button on the **`Control`** tab, **User Control web page**.
  - Enter the Esc`1TVPG` SIS command.
- **To select a program using the program guide**, press the up and down Shift arrow buttons on the remote control to move the highlighting through the program list. When a program is highlighted, the name, time period, and a brief description of the program are displayed to the left of the program list. You can also enter SIS commands to move the highlighting up (Esc`+TVPG`) or down (Esc`–TVPG`) through the program list.
- **To close the program guide**, do one of the following:
  - Press the Guide button on the remote control again.
  - Click the `Prog Guide ON` button again to remove the green highlighting (control software).
  - Click the `Program Guide Off` button on the User Control web page.
  - Enter the SIS command Esc`ØTVPG`.

**NOTE:** When you adjust the volume or change the channel (using any method), the Program Guide closes.

# Remote Configuration and Control

This section describes the serial, Ethernet, and USB connections through which the Extron Simple Instruction Set (SIS) commands can be issued, and lists the commands that are available for configuring and controlling the AVT 200HD. Topics include:

- **Serial Port**
- **USB Port**
- **Ethernet Port**
- **Using SIS Commands**
- **Accessing the AVT 200HD Control Software**

## Serial Port

The AVT supports RS-232 serial communication protocol and can operate at 9600, 19200, 38400, or 115200 baud rates (see "**Configuring the serial port and IP parameters**" in the "Operation" section to configure this port using the front panel menus).

The 5-pole shared 3.5 mm captive screw connector labeled RS-232/IR on the rear panel can be connected to the serial port of a host device such as a computer running a utility such as the Extron DataViewer or HyperTerminal, an RS-232 capable PDA, or a control system (see "**Wiring for RS-232 Control**" in the "Installation" section for information on connecting to this port).

## USB Port

SIS commands can also be sent through the USB Config port on the AVT front panel, using Extron DataViewer or another utility that accommodates USB. (see "**Connecting to the USB Port**" in the "Installation" section to set up communication via USB).

## Ethernet Port

The RJ-45 connector on the rear panel can be connected to an Ethernet LAN or WAN to enable SIS control of the AVT. The tuner and the controlling device can communicate via Extron DataViewer or Telnet (a TCP socket using port 23). The Telnet port number can be changed, if necessary, via SIS commands (see "**Connecting as a Telnet Client**" in the "Reference Information" section for information on connecting via Telnet).

### Ethernet Cable

The Ethernet cable must be properly terminated for your application as either a straight-through cable or a crossover cable (see "**Ethernet Connection**" in the "Installation" section for pin assignments for these cables).

## IP Address

To access the AVT 200HD via the Ethernet port, obtain the IP address of the tuner from your network administrator. If the IP address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping (ICMP) utility (see "**IP Addressing**" in the "Reference Information" section for more information). If the IP address has not been changed, the factory-specified default is 192.168.254.254.

## Establishing an Ethernet Connection

Establish a network connection to a AVT 200HD as follows:

1. Open a TCP connection to port 23, using the IP address of the tuner. (A variety of methods are available for making this connection, including Telnet and utilities such as Extron DataViewer and HyperTerminal).

   The tuner responds with a copyright message that includes the date, the name of the product, firmware version, part number, and the current date and time.

   **NOTE:** If the tuner is not password-protected, the device is ready to accept SIS commands immediately after it sends the copyright message.

   If the tuner is password-protected, a `password` prompt appears below the copyright message.

2. If the tuner is password protected, enter the appropriate administrator or user password.
3. If the password is accepted, the tuner responds with `Login User` or `Login Administrator`.

   If the password is not accepted, the `Password` prompt reappears.

## Connection Timeouts

The Ethernet link times out after a designated period of no communications. By default, this timeout value is set to 5 minutes; however, the value can be changed (see the **Set current connection port timeout** command in the Command/Response Table for IP-Specific SIS Commands, later in this section).

**NOTE:** Extron recommends leaving the default timeout at 5 minutes and periodically issuing the Query (Q) command to keep the connection active. If there are long idle periods, Extron recommends disconnecting and reopening the connection when another command must be sent.

# Using SIS Commands

SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each tuner response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

## Tuner-initiated Messages

When a local event such as a front panel operation occurs, the tuner responds by sending a message to the host. The tuner-initiated messages are listed below (underlined).

- **Copyright message**

  **With an RS-232 connection:**

  (c) Copyright 2011, Extron Electronics AVT 200HD, Vx.xx, 60-770-01↵

  **With an Ethernet connection:**

  (c) Copyright 2011, Extron Electronics, AVT 200HD, Vx.xx, 60-770-01↵

  Ddd, DD Mmm YYYY HH:MM:SS ↵

  The tuner initiates the copyright message when it is first powered on or when an IP is established. V*x.xx* is the firmware version number. With the Ethernet connection, a carriage return and the date and time are added to the copyright message.

  This message is not displayed with a USB connection.

- ↵Password:

  The tuner initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the tuner is password protected. This message means that the tuner requires an administrator or user level password before it will respond to the commands entered via this link.

  The unit responds with one of the following messages, depending on the password that was entered:

- ↵Login Administrator↵

  ↵Login User↵

  The tuner initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the tuner defaults to administrator privileges.

  **NOTE:** The Password prompt is redisplayed if an incorrect password is entered.

  TunerReady↵

  After a unit reset or an output resolution change, the tuner sends this message to indicate the reset is complete.

## V-chip Security for Parental Control

In addition to passwords for administrators and users, a V-chip personal identification number (PIN) is required to access and view parental control settings. With this PIN, you can view and change these settings when logged in at either the administrator or user level. You can set or change this password using SIS commands.

## Tuner Error Responses

If the AVT is unable to perform an SIS command that it receives because the command is invalid or contains invalid parameters, the tuner returns an error response to the host. Response include:

E01 — Invalid input number (too large)
E10 — Invalid command
E11 — Invalid preset number
E12 — Invalid port number
E13 — Invalid value (out of range)
E14 — Command not available for this configuration
E17 — System timed out
E22 — Busy
E24 — Privilege violation
E25 — Device not present
E26 — Maximum number of connections exceeded
E27 — Invalid event number
E28 — Bad filename or file not found
E30 — Hardware failure (followed by a colon [:] and a descriptor number)
E31 — Attempt to break port pass-through when it has not been set
E32 — Incorrect V-chip password

**NOTE:** User privileges extend to all view and read commands except reading the administrator password. Users can also perform the following functions:

- Recalling presets
- Muting outputs
- Viewing V-chip settings (must enter the V-chip PIN)

## Error Response References

[14] = Commands that give an E14 (invalid command for this configuration) error if sent to a product whose current configuration does not support the command

[24] = Commands that give an E24 (privilege violation) error if you are not logged on at administrator level

[27] = Commands that may give an E27 (invalid event number) error

[28] = Commands that may give an E28 (file not found) error

## Using the Command/Response Tables for SIS Commands

The **command/response tables** begin on **page 45**. Upper- and lowercase letters are acceptable in the command field except where indicated. The table below shows the hexadecimal equivalent of each ASCII character used in the command/response table.

Space →

| ASCII to Hex Conversion Table | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | ! | 21 | " | 22 | # | 23 | $ | 24 | % | 25 | & | 26 | ' | 27 |
| ( | 28 | ) | 29 | * | 2A | + | 2B | , | 2C | - | 2D | . | 2E | / | 2F |
| 0 | 30 | 1 | 31 | 2 | 32 | 3 | 33 | 4 | 34 | 5 | 35 | 6 | 36 | 7 | 37 |
| 8 | 38 | 9 | 39 | : | 3A | ; | 3B | < | 3C | = | 3D | > | 3E | ? | 3F |
| @ | 40 | A | 41 | B | 42 | C | 43 | D | 44 | E | 45 | F | 46 | G | 47 |
| H | 48 | I | 49 | J | 4A | K | 4B | L | 4C | M | 4D | N | 4E | O | 4F |
| P | 50 | Q | 51 | R | 52 | S | 53 | T | 54 | U | 55 | V | 56 | W | 57 |
| X | 58 | Y | 59 | Z | 5A | [ | 5B | \ | 5C | ] | 5D | ^ | 5E | _ | 5F |
| ` | 60 | a | 61 | b | 62 | c | 63 | d | 64 | e | 65 | f | 66 | g | 67 |
| h | 68 | i | 69 | j | 6A | k | 6B | l | 6C | m | 6D | n | 6E | o | 6F |
| p | 70 | q | 71 | r | 72 | s | 73 | t | 74 | u | 75 | v | 76 | w | 77 |
| x | 78 | y | 79 | z | 7A | { | 7B | \| | 7C | } | 7D | ~ | 7E | DEL | 7F |

| Esc | 1B |
|---|---|

| CR | 0D |
|---|---|

| LF | 0A |
|---|---|

**Figure 35. ASCII to Hexadecimal Conversion**

## Special Characters

The following characters are invalid preset names, the tuner name, passwords, or locally created file names:

**~ @ = ` [ ] { } < > ' ' " " ;** (semicolon) **:** (colon) **| / \ ?** and **space**.

## Symbol Definitions for AVT 200HD Specific Commands

↵ = Carriage return with line feed

← = Carriage return with no line feed

• = Space

| = Pipe (vertical bar) character. For URL-encoded commands, has the same function as ↵.

Esc = Escape key

W = For URL-encoded commands, has the same function as Esc.

| | | |
|---|---|---|
| X1 | = Channel number, major | ØØ1 – 135 (preceding the decimal point; displayed as three digits with leading zeros) |
| X2 | = Channel number, minor | Ø1 – 99999 (following the decimal point; displayed as 2 digits for air channels, 5 digits for cable channels, with leading zeros) |
| X3 | = Physical channel number | 1 – 135 |
| X4 | = Signal source (TV standard) | Ø = air (default)<br>1 = cable, standard<br>2 = cable, HRC<br>3 = cable, IRC |
| X5 | = Display type | Ø = 16x9 (default)<br>1 = 4x3 |
| X6 | = Display mode | Ø = fill<br>1 = follow (default)<br>2 = zoom |
| X7 | = Closed captioning service | Ø = off (default) 4 = Service 4<br>1 = Service 1 5 = Service 5<br>2 = Service 2 6 = Service 6<br>3 = Service 3 |
| X8 | = Audio language selection | Ø = English (default)<br>1 = Spanish<br>2 = French |
| X9 | = Digital audio output format | 1 = AC-3 (Dolby digital surround)<br>2 = PCM |
| X10 | = On/off, tune/preset mode, or channel found/not found | Ø = off, tune mode, or channel not found<br>1 = on, preset mode, or channel found |
| X11 | = HDCP compliance of display (verbose mode) | Ø = not connected<br>1 = HDCP sink (receiver)<br>2 = non-HDCP sink |
| X12 | = Executive mode | Ø = off (unlocked)<br>1 = mode 1 (complete lockout)<br>2 = mode 2 (only volume unlocked)<br>3 = mode 3 (IR remote locked) |
| X13 | = Internal temperature | Degrees Fahrenheit |
| X14 | = Volume range | Ø – 1ØØ% |
| X15 | = Closed caption font size | Ø = medium (default)<br>1 = large<br>2 = small |
| X16 | = Closed caption font style | Ø through 7 (default = font 0) |

| | | | |
|---|---|---|---|
| X17 | = Closed caption foreground and background color | Ø = white<br>1 = black<br>2 = red<br>3 = green | 4 = blue<br>5 = yellow<br>6 = magenta<br>7 = cyan |
| X18 | = Closed caption text and background fill | Ø = solid<br>1 = transparent<br>2 = translucent<br>3 = flashing | |
| X19 | = Channel scan progress | Ø – 100% | |
| X20 | = Number of channels found | Ø – 999 | |
| X21 | = Movie rating | Ø = none<br>1 = G<br>2 = PG<br>3 = PG13 | 4 = R<br>5 = NC-17<br>6 = X<br>7 = NR |
| X22 | = TV rating | Ø = none<br>1 = TV-Y<br>2 = TV-Y7<br>3 = TV-G | 4 = TV-PG<br>5 = TV-14<br>6 = TV-MA |
| X23 | = Preset name | 10 characters maximum<br>Upper- and lowercase alphanumeric characters are valid. | |
| X25 | = Preset number | 1 – 99 | |
| X26 | = Output resolution | Ø = 480i @ 59.94 Hz<br>1 = 480p @ 59.94 Hz<br>2 = 720p @ 60 Hz<br>3 = 1080i @ 60 Hz | |
| X27 | = Output polarity | Ø = H- V-<br>1 = H- V+<br>2 = H+ V-<br>3 = H+ V+ | |
| X28 | = Closed caption edge type | Ø = none<br>1 = raised<br>2 = recessed<br>3 = uniform<br>4 = left shadow<br>5 = right shadow | |
| X29 | = Channel name | Up to 7 characters | |
| X30 | = TV rating of current program | Up to 16 characters | |
| X31 | = Signal strength | Ø – 100% | |

**NOTE:** The following characters are invalid in names and other text:
{space} ~ , @ = ‘ [ ] { } < > ’ ’ “ ” ; : | \ and ?.

| | | | |
|---|---|---|---|
| X32 | = V-chip (parental control) personal identification number (PIN) | Consists of 4 digits. | |
| X33 | = Sudio mute status | Ø = audio unmuted<br>1 = audio muted<br>2 = only S/PDIF audio muted | |

## Command/Response Table for AVT 200HD SIS Commands

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **NOTE:** Commands can be entered back-to-back in a string, with no spaces. **Example:** TvprS25*11•3 | | | |
| **RF Input and Channel Selection** | | | |
| **Channel Scan** | | | |
| Begin channel scan | Esc1TVSC↵ | Tvsc1↵ | Start scanning for available channels. |
| Stop channel scan | EscØTVSC↵ | TvscØ↵ | Stop scanning for channels. |
| View channel scan progress | EscTVSC↵ | X19↵<br>***In verbose mode:***<br>Tvsc*X19↵ | View the percentage completed of the channel scan. For X19:<br>Ø = no scan in progress<br>1–1ØØ = percent of scan completed |
| View channel scan list | EscTVSL↵ | X1.X2*X10 ↵ X1.X2*X10 ↵...↵↵<br>***In verbose mode:***<br>SX1.X2*X10 ↵ SX1.X2*X10 ↵...↵↵ | View the list of channels resulting from the scan.<br>X1 = major number: 1–135 (displayed as three digits with leading zeros, preceding the decimal point)<br>X2 = minor number: 1–99 for air channels; 1-99999 for cable channels (displayed as 2 or 5 digits with leading zeros, following the decimal point)<br>For X10: 1 = enabled; Ø = disabled. |
| *Example:* | EscTVSL↵ | ØØ5.Ø1*1↵<br>ØØ5.Ø2*1↵<br>Ø11.Ø3*1↵<br>Ø18.Ø1*1↵<br>...<br>Ø58.Ø4*1↵ ↵ | |
| View specific channel | EscX1*X2TVSL↵ | X10↵<br>***In verbose mode:***<br>TvslX1.X2*X10 ↵ | Check if a specific channel was found by the scan.<br>For X10:<br>Ø = channel not found<br>1 = channel found |
| View number of channels found | EscTVSN↵ | X20 ↵<br>***In verbose mode:***<br>TvsnX20↵ | View the number of channels found in the most recent scan.<br>X20 = Ø–99 |
| Clear channel scan list | EscØ*TVSL↵ | Tvsl↵ | Delete all scanned channels. |
| **Tune Mode (Edited Channel List)** | | | |
| View tune mode (edited) channel list | EscTVCH↵ | X1.X2 ↵ X1.X2 ↵...↵ ↵<br>***In verbose mode:***<br>TX1.X2 ↵ TX1.X2 ↵...↵ ↵ | Display a list of only the channels that have not been hidden (for example, a customized list with channels having poor signal quality eliminated). |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **RF Input and Channel Selection (continued)** | | | |
| **Tune mode (edited channel list) (continued)** | | | |
| View a specific channel on the edited list | Esc X1*X2TVCH← | X10↵<br>***In verbose mode:***<br>TvchX1.X2*X10↵ | Check if a specific channel on the customized list was found by the scan. |
| Add channel | Esc A X1*X2TVCH← | TvchAX1.X2↵ | Add channel X1.X2 to the edited channel list. |
| Delete channel | Esc D X1*X2TVCH← | TvchDX1.X2↵ | Delete channel X1.X2 from the edited channel list. |
| **Channel Selection in Tune Mode** | | | |
| Select channel by number | X1*X2T← | TvctX1.X2↵ | Select channel X1.X2. |
| Increment channel number | +T | TvctX1.X2↵ | Select the next available channel in ascending order. |
| Decrement channel number | –T | TvctX1.X2↵ | Select the next available channel in descending order. |
| Previous channel | ØT | TvctX1.X2↵ | Return to the previously selected channel. |
| View current channel | T | X1 . X2↵<br>***In verbose mode:***<br>TvctX1.X2↵ | View the currently selected channel number. |
| View physical channel | *T | X3↵<br>***In verbose mode:***<br>TvctX1.X2*X3↵ | View current physical channel X3. X3 = 1–135.<br>The physical channel number corresponds to a 6 MHz frequency range (see the **Frequency tables** in the "Reference Information" section). |
| View TV channel name | EscTVNM← | X29↵<br>***In verbose mode:***<br>TvnmX29↵ | View the name (X29) of the currently selected TV channel. X29 is a string of up to 7 characters.<br>*Example:* NBC-4LA |
| **Presets** | | | |
| Save current channel to preset | Esc S X25TVPR← | TvprSX25*X1.X2↵ | Save the current channel to preset X25. |
| Save specific channel to preset | Esc S X1*X2*X25TVPR← | TvprSX25*X1.X2↵ | Save channel X1.X2 to preset X25. |
| Delete preset | Esc D X25TVPR← | TvprDX25*ØØØ.ØØ↵ | Delete preset X25. |
| Delete all presets | Esc D *Ø TVPR← | TvprD↵ | Delete all presets. |
| View all presets | EscTVPR← | PØ1•TX1.X2•N*name*↵ PØ2•TX1.X2•*name*↵...<br>P99•TX1.X2•N*name*↵↵ | View a list of all presets that have been saved. |
| *Example:* | EscTVPR← | PØ1 TØØ5.Ø1 NKTLA-DT↵<br>PØ2 TØØ4.Ø1 NPresetØ2↵<br>PØ3 TØ11.Ø3 NPresetØ3↵<br>PØ4 TØ18.Ø4 NPresetØ4↵<br>PØ5 TØ3Ø.Ø1 NPresetØ5↵↵ | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **RF Input and Channel Selection (continued)** | | | |
| **Presets (continued)** | | | |
| Name preset | Esc X25 , X23 NG ← | Nmg X25 , X23 ↵ | Assign name X23 to preset X25. Command character is a comma. Presets can have up to eight characters. |
| **NOTE:** The following characters are invalid in preset names: ~ @ = ` [] {} <> ’ ‘ “ ” ; (semicolon) : (colon) \| / \ ? and space. | | | |
| *Example:* | Esc 2,NBC–LANG ← | Nmg2,NBC–LA ↵ | Name preset 2 “NBC–LA.” |
| View preset name | Esc X25 NG ← | Nmg X25 , X23 ↵ | View the name of preset X25. |
| **NOTES:** • If no preset is assigned to the X25 number that was entered, the name is shown as [unassigned]. • If a channel preset is saved but not named, its default name is Preset*nn*. • If you try to name an unassigned preset, error code E11 is displayed. • If you try to recall a preset number to which no channel has been saved, error code E11 is displayed. | | | |
| **Channel Selection in Preset Mode** | | | |
| Select channel by preset number | X25 T | TvprR X25 * X1 . X2 ↵ | Select preset X25 (to select channel X1 . X2). |
| Increment preset | +T | TvprR X25 * X1 . X2 ↵ | Select the next preset number in ascending order (to select channel X1 . X2). |
| Decrement preset | –T | TvprR X25 * X1 . X2 ↵ | Select the next preset number in descending order. |
| Previous preset | ØT | TvprR X25 * X1 . X2 ↵ | Return to the previously selected preset. |
| View current preset | T | TvprR X25 * X1 . X2 ↵ | Show the current preset channel name and number. |
| View physical channel for current preset | *T | TvprR X25 * X3 ↵ | Show current physical channel X3 for preset X25. X3 = 1–135. The physical channel number corresponds to a 6 MHz frequency range (see the **Frequency Tables** in the “Reference Information” section). |
| **Video Output** | | | |
| Set output resolution and rate | Esc X26 RATE ← | Rate X26 ↵ | Select output resolution and refresh rate X26. For X26: Ø = 480i @ 59.54 Hz 1 = 480p @ 59.94 Hz 2 = 720p @ 60 Hz 3 = 1080i @ 60 Hz |
| View output resolution and rate | Esc RATE ← | X26 ↵ | Show the current output resolution and refresh rate. |
| Set output polarity | Esc X27 OPOL ← | Opol X27 ↵ | Set the polarity for the RGBHV output. |
| View output polarity | Esc OPOL ← | X27 ↵ | Show the current output polarity setting. |
| Select display aspect ratio | Esc T X5 ASPR ← | AsprT X5 ↵ | Select output screen type X5. For X5: Ø = 16x9 1 = 4x3 |
| View display aspect ratio | Esc TASPR ← | X5 ↵ | Show the current display type. |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Video Output (continued)** | | | |
| Select the display mode | Esc M X6ASPR← | Aspr M X6↵ | Select display mode X6. For X6:<br>Ø = fill<br>1 = follow<br>2 = zoom |
| View display mode | Esc M ASPR← | X6↵ | Show the current display mode. |
| Select the tuning mode (tune or preset) | EscX10TVTM← | TvtmX10↵ | Place the AVT in tune or preset mode X10. For X10:<br>Ø = tune mode<br>1 = preset mode |
| View tuning mode | EscTVTM← | X10↵ | Show the current tuning mode for the AVT. |
| Video freeze | 1F | Frz1↵ | Freeze the video image. |
| Video unfreeze | ØF | FrzØ↵ | Unfreeze the video image. |
| View freeze status | F | X10↵ | Show current freeze status X10. For X10:<br>Ø = video freeze off<br>1 = video frozen |
| Video mute | 1B | Vmt1↵ | Mute (blank) the video image. |
| Video unmute | ØB | VmtØ↵ | Unmute (show) the video image. |
| Video mute status | B | X10↵ | Show video mute status X10. For X10:<br>Ø = video unmuted<br>1 = video muted |
| **On-screen display (OSD)** | | | |
| Introductory channel display | EscX10TVOS← | TVOSX10↵ | Show the introductory on-screen display for 3 seconds after tuning to a channel. For X10:<br>Ø = Do not display the OSD.<br>1 = Display the OSD for 3 seconds (default).<br>2 = Display only the current channel information for 3 seconds. |
| View introductory channel display status | EscTVOS← | X10↵ | Show OSD introductory channel information display status X10. |
| Channel program guide | EscX10TVPG← | TvpgX10↵ | Display the OSD program guide. For X10:<br>Ø = program guide off<br>1 = program guide displayed |
| Move up program guide | Esc+TVPG← | Tvpg↵ | Move the highlighting up through the listed programs on the OSD program guide. |
| Move down program guide | Esc–TVPG← | Tvpg↵ | Move the highlighting down through the program guide. |
| View program guide status | EscTVPG← | X10↵ | Show status X10 of the program guide. |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Video Output (continued)** | | | |
| **Closed captioning** | | | |
| Select CC service | Esc C X7TVCC← | TvccCX7↵ | Select closed captioning service X7. For X7:<br>Ø = closed captioning off<br>1–6 = closed captioning services 1 through 6 |
| View CC service | C TVCC← | X7↵ | Show closed captioning service selection X7. |
| Setup type | Esc U X10TVCC← | TvccUX10↵ | Select setup source X10 for CC appearance parameters. For X10:<br>Ø = Follow the TV program parameters (default).<br>1 = Enable parameters to be set up by the user (customized). |
| View CCF setup type | Esc U TVCC← | X10↵ | Show setup source X10. |
| **NOTE:** To specify the following parameters, you must select **1** (customized) for the CC setup type. | | | |
| Select CC text size | Esc F X15FSCC← | FsccFX15↵ | Select font size X15 for the closed caption. For X15:<br>Ø = medium (default)<br>1 = large<br>2 = small |
| View CC text size | Esc F FSCC← | X15↵ | Show the selected font size. |
| Select CC text style | Esc S X16FSCC← | FsccSX16↵ | Select font style X16 for the closed caption. For X16:<br>Ø = Undefined (use the broadcast font) (default)<br>1 = Mono Serif<br>2 = Proportional Serif<br>3 = Mono Sans Serif<br>4 = Proportional Sans Serif<br>5 = Casual<br>6 = Cursive<br>7 = Small Caps |
| View CC text style | Esc S FSCC← | X16↵ | Show the selected font style. |
| Select CC text color | Esc C X17FSCC← | FsccCX17↵ | Select font color X17 for the closed caption. For X17:<br>Ø = white (default)<br>1 = black<br>2 = red<br>3 = green<br>4 = blue<br>5 = yellow<br>6 = magenta<br>7 = cyan |
| View CC text color | Esc C FSCC← | X17↵ | Show the selected font color. |
| Select CC text fill | Esc O X18FSCC← | FsccOX18↵ | Select type of fill X18 for the closed caption font.<br>For X18:<br>Ø = solid (default)<br>1 = transparent<br>2 = translucent<br>3 = flashing |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Video Output (continued)** | | | |
| **Closed Captioning (continued)** | | | |
| View CC text fill | Esc 0 FSCC← | X18↵ | Show the selected font fill. |
| Select CC background color | Esc K X17FSCC← | FsccKX17↵ | Select background color X17 for the closed caption. For X17:<br>Ø = white<br>1 = black (default)<br>2 = red<br>3 = green<br>4 = blue<br>5 = yellow<br>6 = magenta<br>7 = cyan |
| View CC background color | Esc K FSCC← | X17↵ | Show the selected background color. |
| Select CC background fill | Esc T X18FSCC← | FsccTX18↵ | Select type of fill X18 for the closed caption background. For X18:<br>Ø = solid (default)<br>1 = transparent<br>2 = translucent<br>3 = flashing |
| View CC background fill | Esc T FSCC← | X18↵ | Show the selected background fill. |
| Select CC text edge type | Esc E X28FSCC← | FsccEX28↵ | Select text edge type X28 for the closed caption. For X28:<br>Ø = none (default)<br>1 = raised<br>2 = recessed<br>3 = uniform<br>4 = left shadow<br>5 = right shadow |
| View CC text edge type | Esc E FSCC← | X28↵ | Show the selected edge type. |
| Select CC edge color | Esc D X17FSCC← | FsccDX17↵ | Select edge color X17 for the closed caption. For X17:<br>Ø = white<br>1 = black (default)<br>2 = red<br>3 = green<br>4 = blue<br>5 = yellow<br>6 = magenta<br>7 = cyan |
| View CC edge color | Esc D FSCC← | X17↵ | Show the selected edge color. |
| **Audio Output** | | | |
| Set digital audio output format | EscX9AFMT← | AfmtX9↵ | Select digital output type X9. For X9:<br>1 = AC-3 (Dolby digital)<br>2 = PCM |
| View digital audio output format | EscAFMT← | X9↵ | Show the selected digital audio output format. |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Audio Output (continued)** | | | |
| Select output language | Esc X8 LANG ← | Lang X8 ↵ | Set the language of the output to X8. For X8:<br>Ø = English<br>1 = Spanish<br>2 = French |
| View language | Esc LANG ← | X8 ↵ | Show the selected output language. |
| Audio mute, all outputs | 1Z ← | Amt1 ↵ | Mute the audio. |
| Audio unmute | ØZ | AmtØ ↵ | Turn the audio mute off. |
| Audio mute–S/PDIF | 2Z ← | Amt2 ↵ | Mute S/PDIF audio only. |
| View audio mute status | Z | X33 ↵ | View audio mute status X33.<br>For X33:<br>Ø = unmuted<br>1 = muted<br>2 = only S/PDIF audio muted |
| Set volume level | X14 V | Vol X14 ↵ | Set the volume level to X14.<br>X14 = Ø–1ØØ%.<br>(Default = 1ØØ%.) |
| Increment volume level | +V | Vol X14 ↵ | Increase the volume level by one step (to X14). |
| Decrement volume level | –V | Vol X14 ↵ | Decrease the volume level by one step (to X14). |
| View volume level | V | X14 ↵ | View the current volume level. |
| **V-chip Setup (Parental Control)** | | | |
| **Personal Identification Number (PIN) Setup** | | | |
| **NOTE:** To enter any V-chip setup command, you must enter the assigned 4-digit PIN to access V-chip setup. The default PIN is ØØØØ. | | | |
| Change V-chip PIN | Esc P X32 **new PIN* VCHP ← | VchpP *new PIN* ↵ | Set a new 4-digit PIN for the access to the V-chip.<br>X32 = previous PIN number. |
| *Example:* | Esc P6842*8Ø21VCHP ← | VchpP8Ø21 ↵ | The V-chip PIN number has been changed from 6842 to 8Ø21. |
| View PIN number | Esc Q VCHP ← | X32 ↵<br>***In verbose mode:***<br>VchpQ X32 ↵ | If no PIN has been assigned, X32 is ØØØØ (default). |
| Reset PIN number | Esc P X32*VCHP ← | VchpPØØØØ ↵ | Set V-chip PIN X32 to ØØØØ (default). |
| **Movie rating setup** | | | |
| Set V-chip for movie ratings | Esc M X32*X21 VCHP ← | Vchp M X21 ↵ | Set movie ratings X21 to be blocked by the V-chip.<br>For X21:<br>Ø = unblock all ratings (default).<br>1 = Block G, PG, PG13, R, NC17, and X.<br>2 = Block PG, PG13, R, NC17, and X ratings.<br>3 = Block PG13, R, NC17, and X.<br>4 = Block R, NC17, and X.<br>5 = Block NC17 and X.<br>6 = Block X ratings only. |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **V-chip Setup (continued)** | | | |
| View movie V-chip setting | Esc M VCHP← | X21↵ | Show movie ratings to be blocked by the V-chip. |
| **TV Rating Setup** | | | |
| Enable or disable V-chip for TV | Esc T X32*X10VCHP← | VchpTX10↵ | Enable or disable the V-chip for blocking TV shows.<br>For X10:<br>Ø = off (default)<br>1 = on<br>X32 = Current V-chip access PIN number. |
| *Example:* | Esc T8Ø21*1VCHP← | VchpT1↵ | The V-chip is enabled for TV. |
| View V-chip setting for TV | Esc T VCHP← | X10↵ | Show V-chip on/off setting for TV programs. |
| Set ratings to be blocked for children | Esc C X32*X22VCHP← | VchpCX22↵ | Set TV ratings X22 to be blocked by the V-chip for viewing by children. For X22:<br>Ø = Unblock all ratings.<br>1 = Block TV-Y and TV-Y7.<br>2 = Block TV-Y7 only. |
| View TV ratings block for children | Esc C VCHP← | X22↵ | Show the TV ratings to be blocked for children. |
| Set ratings to be blocked for other age groups | Esc A X32*X22VCHP← | VchpAX22↵ | Set TV ratings X22 to be blocked by the V-chip for other age groups. For X22:<br>Ø = Unblock all ratings.<br>1 = Block TV-G, TV-PG, TV-14, and TV-MA.<br>2 = Block TV-PG, TV-14, and TV-MA.<br>3 = Block TV-14 and TV-MA.<br>4 = Block TV-MA only. |
| View ratings block for age group | Esc A VCHP← | X22↵ | Show the TV ratings to be blocked for other age groups. |
| Set V-chip to block fantasy violence (FV) ratings for children | Esc F X32*X22VCHP← | VchpFX22↵ | Set FV rating X22 to be blocked by the V-chip for viewing by children. For X22:<br>Ø = unblock all FV ratings<br>1 = block FV ratings for TV-Y7. |
| View FV rating block | Esc F VCHP← | X22↵ | Show the FV block setting. |
| Set V-chip to block suggestive dialog (D) ratings | Esc D X32*X22VCHP← | VchpDX22↵ | Set D ratings X22 to be blocked by the V-chip. For X22:<br>Ø = Unblock all ratings.<br>1 = Block D ratings for TV-PG and TV-14.<br>2 = Block D ratings for TV-14 only. |
| View D rating block | Esc D VCHP← | X22↵ | Show the D block setting. |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **V-chip Setup (continued)** | | | |
| Set V-chip to block coarse language (L) ratings | Esc L X32*X22VCHP← | VchpLX22↵ | Set L ratings X22 to be blocked by the V-chip. For X22:<br>Ø = Unblock all ratings.<br>1 = Block L for TV-PG, TV-14, and TV-MA.<br>2 = Block L for TV-14 and TV-MA.<br>3 = Block L for TV-MA only. |
| View L rating block | Esc L VCHP← | X22↵ | Show the L block setting. |
| Set V-chip to block sexual situations (S) ratings | Esc S X32*X22VCHP← | VchpSX22↵ | Set S ratings X22 to be blocked by the V-chip. For X22:<br>Ø = Unblock all ratings.<br>1 = Block S for TV-PG, TV-14, and TV-MA.<br>2 = Block S for TV-14 and TV-MA.<br>3 = Block S for TV-MA only. |
| View S rating block | Esc S VCHP← | X22↵ | Show the S block setting. |
| Set V-chip to block violence (V) ratings | Esc V X32*X22VCHP← | VchpVX22↵ | Set V ratings X22 to be blocked by the V-chip. For X22:<br>Ø = Unblock all ratings.<br>1 = Block V for TV-PG, TV-14, and TV-MA.<br>2 = Block V for TV-14 and TV-MA.<br>3 = Block V for TV-MA only. |
| View V rating block | Esc V VCHP← | X22↵ | Show the V block setting. |
| View current TV program block | Esc B VCHP← | X10↵<br>***In verbose mode:***<br>VchpBX10↵ | Show block status X10 of the current TV program. For X10:<br>Ø = not blocked<br>1 = blocked |
| View current TV program rating | Esc R VCHP← | X30↵<br>***In verbose mode:***<br>VchpRX10↵ | Show rating X30 of the current TV program. X30 is a string of up to 16 characters. |
| **Other Settings** | | | |
| Select TV standard | Esc X4 TVST← | TvstX4↵ | Set the TV format X4 for the incoming RF signal. For X4:<br>Ø = over-the air<br>1 = cable standard<br>2 = cable HRC<br>3 = cable IRC |
| View TV standard | Esc TVST← | X4↵ | Show the current RF input. |
| View broadcast flag | Esc I HDCP← | X10↵<br>***In verbose mode:***<br>HDCPIX10↵ | Show status X10 of the broadcast flag, which indicates that the TV data stream contains HDCP protected material. For X10:<br>Ø = flag off<br>1 = flag on |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Other Settings (continued)** | | | |
| Show HDCP for output display | Esc 0 HDCP← | X11↵<br>***In verbose mode:***<br>HDCP0X11↵ | Show HDCP compliance X11 for the display. For X11:<br>Ø = output connected with encrypted input but not HDCP compliant<br>1 = output connected with encrypted input and HDCP compliant<br>2 = No output connected<br>3 = Output connected, input not encrypted or not connected, output HDCP status unknown |
| **Executive Mode (Front Panel Lockout)** | | | |
| Enable executive mode 1 | 1X | Exe1↵ | Select executive mode 1: block all front panel access (IR remote control is available). |
| Enable executive mode 2 | 2X | Exe2↵ | Select executive mode 2: block all front panel access except volume control (IR remote control is available). |
| Enable executive mode 3 | 3X | Exe3↵ | Select executive mode 3: block IR remote control access only. |
| Disable executive mode | ØX | ExeØ↵ | Turn executive mode off. |
| View executive mode status | X | X12↵ | View current executive mode. |
| **Information Requests** | | | |
| General information | I | TvtmX10•TvctX1.X2•SigX31↵ | Show the currently selected tuning mode (X10), channel (X1.X2) and signal strength level (X31).<br>For X10:<br>Ø = tune mode.<br>1 = preset mode.<br>X1 = 1–135; X2 = 1–99<br>X31 = 1–1ØØ% |
| *Example:* | I | Tvtm1 TvctØØ4.Ø1 SigØ42↵ | The AVT is in tune mode; channel 4.1 is selected; signal strength is 42%. |
| Query firmware version | Q | *n.nn*<br>***In verbose mode:***<br>Ver1**n.nn*↵ | Show the current firmware version to two decimal places. |
| Query part number | N | 6Ø-77Ø-Ø1↵<br>***In verbose mode:***<br>Pno 6Ø-77Ø-Ø1↵ | Show the unit part number. |
| Internal temperature | Esc2ØSTAT← | X13↵<br>***In verbose mode:***<br>StatX13↵ | Show the internal temperature in degrees Fahrenheit.<br>X13 = *+nnn.nn* |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Resets** | | | |
| Clear channel list | Esc Ø*TVSL ← | Tvsl ↵ | Clear all channels. |
| Reset user settings | Esc ZI ← | Zpi ↵ | Reset all settings to the factory defaults **except** the channel and preset lists. |
| Total reset | Esc ZXXX ← | Zpx | Reset all settings to the factory defaults. |

## Symbol Definitions for IP-specific Commands

| | | | |
|---|---|---|---|
| X41 | = | Port number | Ø1–99 (represented as two ASCII characters with leading zero if required |
| X42 | = | Command data section | Factory default name (model name + last 3 pairs of MAC address) |
| X43 | = | GMT offset | –12.Ø through +14.Ø. Represents hours and minutes offset from Greenwich mean time (GMT). |
| X45 | = | On and off status | Ø = off or disabled<br>1 = on or enabled |
| X46 | = | Dirty RAM status | Ø = Random access memory has been saved to flash memory (OK to power off or reset).<br>1 = RAM needs to be saved to flash memory |
| X51 | = | Firmware version number | *n.nn* (listed to two decimal places) |
| X52 | = | Unit name | Up to 24 characters: alphabetical (A–Z or a–z), digits (Ø–9), or hyphen (-). |

**NOTES:**
- The following characters are invalid or not recommended in names: {space} + ~ , @ = ` [ ] { } < > ‘ ’ “ ” ; : | \ and ?.
- The first character must be alphabetical.
- The last character must **not** be a hyphen.

| | | | |
|---|---|---|---|
| X53 | = | Local date and time format | **For setting:**<br>In the format MM/DD/YY•HH:MM:SS<br>MM = month: 1Ø (January) through 12 (December)<br>DD = Ø1 through 31<br>YY = ØØ through 99<br>HH = ØØ through 23<br>MM = ØØ through 59<br>SS = ØØ through 59<br>**For reading:**<br>In the format *Day*,•DD•Mmm•YYYY•HH:MM:SS:<br>*Day* = weekday: Mon through Sun<br>DD = Ø1 through 31<br>Mmm = month: (Jan through Dec)<br>YYYY = year: 2ØØØ through 2Ø99<br>HH = ØØ through 23<br>MM = ØØ through 59<br>SS = ØØ through 59 |
| X54 | = | IP address | *nnn.nnn.nnn.nnn*<br>(Leading zeros in each of the four fields are optional for setting values and are suppressed in returned values.<br>Factory default address: 192.168.254.254<br>Default broadcast IP address: 255.255.255.255 |
| X56 | = | Power-up delay between ports in 1/3 second increments. | 1 through 255.<br>Default = 3, or 1 second. |
| X57 | = | Time (in 10-ms increments) to wait for characters to come into a serial port before terminating the connection | 1Ø through 32767<br>Default = 1Ø, or 100 ms |
| X58 | = | Time (in 10-ms increments) to wait between characters before terminating the connection | 2 through 32767<br>Default = 2, or 20 ms |
| X59 | = | Hardware (MAC) address | ØØ-Ø5-A6-xx-xx-xx |

| | | | |
|---|---|---|---|
| X60 | = | Subnet mask | *nnn.nnn.nnn.nnn*<br>(Leading zeros in each of the four fields are optional for setting values and are suppressed in returned values.<br>Default = 255.255.Ø.Ø |
| X61 | = | Message length, delimiter value, or byte count (via the serial port). (This parameter is optional.) | *n***L** = **L**ength of message to be received<br>*n***D** = **D**elimiter value<br>*n* = byte count (1 through 32767; default is Ø)<br>Placed in front of the parameter (*n*D or *n*L) |
| X62 | = | Verbose mode | Ø = clear or none (default for Telnet connection)<br>1 = verbose mode (default for RS-232 connection)<br>2 = tagged responses for queries<br>3 = verbose mode and tagged responses for queries |

**NOTE:** If tagged responses is enabled (modes 2 and 3), all read commands return the constant string and the value as the set command does (for example, the read name command Esc CN ← returns Ipn•X52↵).

| | | | |
|---|---|---|---|
| X63 | = | Priority status for receiving timeouts | 1 = use Send data string parameters (if they exist) (default).<br>2 = use Configure receive timeout command parameters instead. |
| X64 | = | IP address converted into a single 32-bit number<br>**Example:** 1Ø.13.Ø.254 becomes (1Ø*256*256*256) + (13*256*256) + Ø*2456) + 254, which becomes (167,772,16Ø + 851,9678 + 254, which equals 68,624,382. | |
| X65 | = | Baud rate | 96ØØ (default), 192ØØ, 384ØØ, 1152ØØ |
| X66 | = | Parity | **O**dd, **E**ven, **N**one (default), **M**ark, **S**pace (Only the first letter is required.) |
| X67 | = | Data bits | 7, 8 (default) |
| X68 | = | Stop bits | 1 (default), 2 |
| X69 | = | Port type | Ø = RS-232 (default) |
| X70 | = | Flow control | **H**ardware, **S**oftware, **N**one (default) (Only the first letter is required.) |
| X71 | = | Data pacing | Specified in milliseconds between bytes:<br>ØØØØ through 1ØØØ (default = Ø ms) |
| X72 | = | Password | 12 characters maximum |

**NOTE:** The following characters are invalid in passwords:
{space} + ~ , @ = ` [ ] { } < > ‘ ’ “ ” ; : | \ and ?.

| | | | |
|---|---|---|---|
| X73 | = | Daylight saving time | Ø = off or ignore<br>1 = USA (Begins second Sunday in March and ends first Sunday in November.)<br>2 = Europe (Begins last Sunday in March and ends last Sunday in October.)<br>3 = Brazil (Begins third Sunday in October and ends third Sunday in February.) |
| X74 | = | Event number | Ø through 99 (event must be running) |
| X75 | = | Event buffer | Ø = receive<br>1 = unified<br>2 = data<br>3 = NVRAM |
| X76 | = | Event buffer offset | Ø through *maximum buffer size* |

| | | | |
|---|---|---|---|
| X77 | = | Event data size | b = bit<br>B = byte (8 bits)<br>S = short (16 bits)<br>L = long (32 bits) |

**NOTE:** In a write operation, this parameter can optionally be preceded by A (for and) or O (for or) to logically combine with content instead of replacing it.

| | | | |
|---|---|---|---|
| X78 | = | Event data to write | |
| X79 | = | Reading password | Responds with **** if a password exists; the response is empty if there is no password. |
| X80 | = | Number of bytes to read | 1 through 127 |
| X81 | = | E-mail event number/mailbox | 1 through 64 (Response is returned as 3 digits with leading zeros.) |
| X82 | = | E-mail account | 65 through 72<br>65 = email recipient 1, 66 = recipient 2, ...,<br>72 = recipient 8 |
| X83 | = | E-mail recipient address | Typical e-mail address format<br>(for example: *nnnn*@*xxx*.com) |
| X84 | = | Name of e-mail file to be sent (for **CR** command) | The first line of file is the subject; the rest is the body of the e-mail. |
| | | Numeric name of e-mail file to be sent (for **SM** command) | Format = *nnn*.eml. *nnn* = 1 through 999. |
| X85 | = | Default unit name | Combination of the model name and the last three pairs of the unit MAC address (for example, AVT-200-HD-05-62-3D |
| X88 | = | Security level of connection | 11 = user<br>12 = administrator |
| X89 | = | Time (in 10-ms increments) to wait for receive data before releasing port to another source | 1 through 32767 (1=10 ms; 100 = 1000 ms = 1 second)<br>Default = 10, or 100 ms<br>(Response is returned with leading zeros.) |
| X90 | = | ASCII digits representing numeric value of data element read from event buffer. | Leading zeros are suppressed. |
| X95 | = | Broadcast repetition rate in seconds | 0 through 255<br>Default = 0 (clear)<br>(The response is returned with leading zeros.) |
| X96 | = | Login allowed without password | 0 = disabled<br>1 = enabled |
| X98 | = | No-password login level | 1–11 = entry without password goes to the level specified, if an administrator password exists.<br>0 = entry without password is placed one level below the lowest level that has a password (to 0-11).<br>The response is returned as 2 digits with leading zero. |
| X99 | = | Number of seconds before IP connection timeout | 1 through 65000<br>Default = 30 = 300 seconds |
| X103 | = | Hardware (MAC) address with the 4 most significant hex nibbles converted into a single 16-bit decimal number. | |
| X104 | = | Hardware (MAC) address with the 8 least significant hex nibbles converted into a single 32-bit decimal number. | Can be up to 10 digits. |

## Command/Response Table for IP-Specific SIS Commands

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Bidirectional Serial Port** | | | |
| Send data string | Esc X41 * X57 * X58 * X61 RS ← | X42 *response from command* ↵ | |
| Configure port parameters[24] | Esc X41 * X65 , X66 , X67 , X68 CP ← | | |
| | | Cpn X41 • X65 , X66 , X67 , X68 ↵ | |
| | | | Set baud rate X65, parity X66, X67 data bits, and X68 stop bits for port X41.<br>X65 = 9600, 19200, 38400, or 115200 (default = 9600)<br>X66 = odd, even, none, mark, or space. (Only the first letter is required.)<br>X67 = Data bits: 7 or 8 (default = 8)<br>X68 = Stop bits: 1 or 2 (default =1) |
| View port parameters | Esc X41 CP ← | X65 , X66 , X67 , X68 ↵ | |
| Configure flow control[24] | Esc X41 * X70 , X71 ← | Cpn X41 • Cfl X70 , X71 ↵ | Set flow control type X70 for port X41 with X71 ms between bytes. For X70:<br>H = Hardware<br>S = Software<br>N = None (default)<br>X71 = ØØØØ through ØØØ1 (default = Ø ms) |
| View flow control | Esc X41 * CF ← | X70 , X71 ↵ | |
| Configure receive timeout[24] | Esc X41 * X57 * X58 * X63 * X61 CE ← | | |
| | | Cpn X41 • Cce X17 , X58 , X63 , X61 CE ↵ | |
| **NOTE:** X57 = Time in tens of milliseconds that the AVT will wait until receipt of the first response character before terminating the command. (Default = 1Ø = 10 ms; max. = 32767.)<br>X58 = Time in tens of milliseconds that the AVT will wait between characters being received via a serial port before terminating the current command or receive operation. (Default = 2Ø = 20 ms; max. = 32767.)<br>X61 = #L or #D. The letter parameter is case sensitive (requires capital D or capital L). For X61:<br>L = Length of the message to be received,<br>D = Delimiter value. A delimiter of ASCII ØA = 1ØD.<br>\# = Byte count (for L) or a single ASCII character expressed in decimal form (for D).<br>Byte count # can be Ø through 32767; default = 0. The ASCII decimal # can be Ø through ØØ255; default = the byte count. A 3-byte length = 3L. The response includes leading zeros.<br>X63 = Priority Status for port X41 receiving timeouts. For X63:<br>Ø = Use Send data string command parameters (default);<br>1 = Use Configure receive timeout command parameters. The response includes leading zeros. | | | |
| View receive timeout | Esc X1 CE ← | X57 , X58 , X63 , X61 ↵ | |
| **Ethernet Data Port** | | | |
| Set current connection port timeout | Esc Ø * X99 TC ← | Pti Ø * X99 ↵ | Set number of seconds (in tens of seconds) before timeout on IP connections.<br>X99 = 1 through 32767. |
| View current connection port timeout | Esc ØTC ← | X99 ↵ | |
| Set global port timeout | Esc 1 * X99 TC ← | Pti1 * X99 ↵ | |
| View global port timeout | Esc 1TC ← | X99 ↵ | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **IP Setup Commands** | | | |
| Set unit name | Esc X52 CN ← | Ipn•X52 ↵ | Set AVT unit name X52. X52 can be up to 24 characters consisting of A through Z, a through z, Ø through 9, and hyphen (-).<br>The first letter must be alphabetical; the last one must **not** be a hyphen. |
| View unit name | Esc CN ← | X52 ↵ | |
| Reset unit name to factory default[24] | Esc •CN ← | Ipn•X85 ↵ | Reset the AVT name to its factory default name X85.<br>X85 consists of the model name and the last three pairs of the MAC address. |
| *Example:* | Esc •CN ← | Ipn·AVT-2ØØ-HD-Ø5-62-3D | |
| Set time and date[24] | Esc X53 CT ← | Ipt X53 ↵ | X53 is the local date and time format. The set format is MM/DD/YY-HH:MM:SS. (The hours, minutes, and seconds can also be separated by periods.)<br>*Examples:*<br>11/13/Ø6-1Ø:54:ØØ *or*<br>11/13/Ø6-1Ø.54.ØØ |
| View time and date | Esc CT ← | X53 ↵ | |
| Set GMT offset[24] | Esc X43 CZ ← | Ipz X43 ↵ | Set the Greenwich Mean Time (GMT) offset value (X43) for the AVT location. GMT offset (-12.ØØ through +14.ØØ) represents the time difference in hours and minutes (± hh:mm relative to Greenwich, England). The plus sign and leading zero are optional.<br>X43 is in the format *hh*:*mm*.<br>*Example:* 5:3Ø or 5.3Ø = +Ø5:3Ø |
| **NOTE:** In the command, the divider between hours and minutes can be a colon or a period. In the response, it is a colon. | | | |
| *Example:* | Esc 8.ØCZ ← | Ipz+Ø8:ØØ ↵ | |
| View GMT offset | Esc CZ ← | X43 ↵ | |
| Set Daylight Saving Time[24] | Esc X73 CX ← | Ipx X73 ↵ | Set daylight saving time X73:<br>Ø = off or ignore<br>1 = USA (Begins second Sunday in March and ends first Sunday in November.)<br>2 = Europe (Begins last Sunday in March and ends last Sunday in October.)<br>3 = Brazil (Begins third Sunday in October and ends third Sunday in February.) |
| View Daylight Saving Time | Esc CX ← | X73 ↵ | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **IP Setup Commands (continued)** | | | |
| Set DHCP on[24] | Esc 1DH← | Idh1↵ | Set Dynamic Host Configuration Protocol (DHCP) to On. The AVT automatically obtains its IP address from the local network. |
| Set DHCP off[24] | Esc ØDH← | IdhØ↵ | Set DHCP to Off. |
| View DHCP mode | Esc DH← | X45↵ | For X45:<br>1 = DHCP is on.<br>Ø = DHCP is off. |
| Set IP address | Esc X54 CI← | Ipi X54↵ | X54 = IP address (*nnn.nnn.nnn.nnn*). Leading zeros in the octets are optional. |
| View IP address | Esc CI← | X54↵ | Leading zeros are suppressed in returned values. |
| View hardware (MAC) address | Esc CH← | X59↵<br>***In verbose mode:***<br>Iph•X59↵ | X59 = hardware media access code (MAC) address (*xx-xx-xx-xx-xx-xx*). |
| View number of open connections | Esc CC← | *Number of connections*<br>***In verbose mode:***<br>Icc *Number of connections*↵ | |
| Set subnet mask | Esc X60 CS← | Ips X60↵ | X60 = subnet mask (*nnn.nnn.nnn.nnn*). Syntax is the same as for IP addresses. Leading zeros are optional in the octets. |
| View subnet mask | Esc CS← | X60↵ | Leading zeros are suppressed in returned values. |
| Set gateway IP address | Esc X54 CG← | Ipg X54↵ | X54 = IP address (*nnn.nnn.nnn.nnn*). Leading zeros are optional. |
| View gateway IP address | Esc CG← | X54↵ | Leading zeros are suppressed in returned values. |
| Set DNS server IP address | Esc X54 DI← | Ipd•X54↵ | Set the IP address X54 for the Domain Name System (DNS) in the format (*nnn.nnn.nnn.nnn*). Leading zeros in the octets are optional. |
| View DNS server IP address | Esc DI← | X54↵ | Leading zeros are not shown response. |
| Set verbose mode | Esc X62 CV← | Vrb X62↵ | Enable or disable verbose mode type X62. For X62:<br>Ø = clear/none<br>1 = verbose mode<br>2 = tagged responses for queries<br>3 = mode and tagged responses for queries.<br>Default is Ø for Telnet connections and 1 for RS-232 control. |
| View verbose mode | Esc CV← | X62↵ | |
| Set broadcast mode | Esc X95 , X54← | Bmd X95 , X54↵ | |
| Set broadcast mode to default address | Esc X95 EB← | Bmd X95 , X54↵ | |
| Clear broadcast mode | Esc ØEB← | BmdØØØ , X54↵ | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **IP Setup Commands (continued)** | | | |
| View broadcast mode | Esc EB ← | Bmd X95 , X54 ↵ | |
| Set broadcast port and MAC address | Esc X42 * X103 * X104 PB ← | Bpt X42 * X59 ↵ | X42 = UDP outgoing port<br>X103 * X104 = MAC address for UDP unicast transmissions |
| Set event target IP address | Esc X74 , X54 ID ← | Edi X74 * X54 * X42 ↵ | X74 = event number (event must be running).<br>X74 = Ø–99. |
| Set event target TCP port | Esc X74 , X42 ID ← | Edi X74 * X54 * X42 ↵ | |
| Set event target IP address | Esc X74 ID ← | X54 * X42 ↵ | |
| **Password and security settings** | | | |
| Set administrator password[24] | Esc X72 CA ← | Ipa•X79 ↵ | Set administrator access password X72.<br>X72 = 4 to 12 alphanumeric characters. The password is case sensitive. Special characters (spaces or symbols) are not allowed.<br>X79 = hidden password, shown as four asterisks (****) if a password exists; empty if not. |
| View administrator password[24] | Esc CA ← | X79 ↵ | |
| Reset (clear) administrator[24] password | Esc •CA ← | Ipa•↵ | Clear or remove all passwords (administrator and user). |
| Set user password[14,34] | Esc X72 CU ← | Ipu·X79 ↵ | Set user access password X72.<br>X72 = 4 to 12 alphanumeric characters. The password is case sensitive. Special characters (spaces or symbols) are not allowed.<br>X79 = hidden password, shown as four asterisks (****) if a password exists; empty if not. |
| **NOTE:** A user password cannot be assigned if an administrator password does not exist. Entering a password when the AVT has not been configured yields an E14 error response from the tuner. If the administrator password is cleared (removed), the user password is removed also. | | | |
| View user password | Esc CU ← | X79 ↵ | |
| Reset (clear) user password | Esc •CU ← | Ipu•↵ | Clear or remove the user password. |
| Query session security level | Esc CK ← | X88 ↵<br>***In verbose mode:***<br>Pvl X88 ↵ | |
| **Remap Port Destinations** | | | |
| **NOTES:** • Duplicate port number assignment are pnot permitted (for example, the Telnet and web mapping cannot be the same. An E13 (invalid parameter) error code results.<br>• Remapping of the port number other than to reset to defaults 80 or 23, or to disable by resetting it to Ø can be done only to ports 1024 or higher. | | | |
| Set Telnet port map[24] | Esc X42 MT ← | Pmt X42 ↵ | X42 = Telnet port number |
| Reset Telnet port map[24] | Esc 23MT ← | PmtØØ032 ↵ | |
| Disable Telnet port | Esc ØMT ← | PmtØØØØØ ↵ | |
| View Telnet port mapping | Esc MT ← | X42 ↵ | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Remap Port Destinations (continued)** | | | |
| Set web port map[24] | Esc X42 MH ← | Pmh X42 ↵ | |
| Reset web port map[24] | Esc 8ØMH ← | PmhØØØ8Ø ↵ | |
| Disable web port[24] | Esc ØMH ← | PmhØØØØØ ↵ | |
| View web port map[24] | Esc MH ← | X42 ↵ | |
| Set Direct Access port map[24] | Esc X42 MD ← | Pmd X42 ↵ | |
| Reset Direct Access port map[24] | Esc 2ØØ1MD ← | PMDØ2ØØ1 ↵ | |
| Disable Direct Access port map[24] | Esc ØMD ← | PMDØØØØØ ↵ | |
| View Direct Access port map[24] | Esc MD ← | X42 ↵ | |
| **Directories** | | | |
| **NOTES:** Directory name = a text string that can contain letters A–Z, a–z, digits 1–9, minus signs or hyphens (–), plus sign (+), or colons (:). No blank or space characters are permitted. Names are not case-sensitive. The first character **must** be an alpha character.<br>• A directory does not truly exist until a file has been copied into that path.<br>• A file and a directory **can** have the same name.<br>• The current directory is a per-connection setting. It begins at the root for each new IP session. | | | |
| Change or create a directory | Esc *path/directory* /CJ ← | Dir•*path/directory*/ ↵ | |
| Return to root directory | Esc /CJ ← | Dir•/ ↵ | |
| Go up one directory | Esc ..CJ ← | Dir•*path/directory*/ ↵ | |
| View current directory | Esc CJ ← | *path/directory*/ ↵ | |
| **File commands** | | | |
| Erase user-supplied web page or file[24,28] | Esc *filename* EF ← | Del•*filename* ↵ | |
| Erase current directory and its files[24,28] | Esc /EF ← | Ddl ↵ | |
| Erase current directory and sub-directories[24,28] | Esc //EF ← | Ddl ↵ | |
| List files in current directory | Esc DF ← | Unit response—Telnet:<br>*filenamex•date/time•length* ↵<br>*filenamex•date/time•length* ↵<br>*filenamex•date/time•length* ↵<br>...<br>*space_remaining•bytes left* | |
| List files in current directory and lower levels | Esc LF ← | Unit response—HEML sample code:<br>var file—new array ();<br>file [1] = '*filename1*, *date1*, *filesize1*';<br>file [2] = '*filename2*, *date2*, *filesize2*';<br>...<br>file [*n*] = '*filename**n***, *date**n***, *filesize**n***';<br>file [*n*+1] '*space remaining*, *bytes left*' | |
| **NOTE:** LF has the same response from the unit as DF, except path/directory precede filenames for files from directories below the current directory. | | | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Stream files via Telnet or RS-232** | | | |
| Load file to user flash memory[24,28] | Esc+UF *filesize*, *filename*← | Upl↵ | |
| Load file to user flash and set specific time and date[24,28] | Esc+UF *filesize*day-of-week•month•day•year•hour•minute•second*, *filename*← | Upl↵ | *Day-of-week* = 1–7 (1 = Sunday, 2 = Monday ...)<br>*Month* = 1–12 (1 = Jan, 2 = Feb, ...)<br>*Day* = 1–31<br>*Hour* = 0–23<br>*Minute* and *Second* = 0–59 |
| **NOTES:** • If there is insufficient space on the unit to store the sent file, the response is Fld↵ instead of Upl↵ to denote failure.<br>• You can use this command to update firmware by loading a firmware file with a .S19 extension. If the unit determines that the .s19 file is not intended for the AVT 200HD, the Upl↵ response is followed by Fwm↵ (firmware mismatch). | | | |
| Retrieve file from user flash memory[24,28] | Esc *filename* SF← | Responds with 4 bytes of file-size + raw, unprocessed data in file. | |
| **Stream files via port 80** | | | |
| Load file to user flash memory | Use a POST on port 80, followed by the delimited data to be written to the flash file memory. | | |
| Retrieve file from user flash memory | Send a page GET on port 80 followed by:<br>Ie. http://192.168.254.254/mypage.html?cmd=WSF\| | Responds with raw, unprocessed data in file. | |
| **Back up and restore unit configuration** | | | |
| Save unit configuration (to file system) | Esc1* *configuration type* XF← | Cfg1* *configuration type*↵ | For configuration type:<br>Ø = IP configuration (ip.cfg), preset list<br>1 = Event configuration (event.cfg)<br>2 = Unit-specific parameters (box.cfg)<br>The files are stored in the directory /nortxe-backup created on the unit by the Save commands. |
| Restore unit configuration | EscØ* *configuration type* XF← | CfgØ* *configuration type*↵ | |
| **Event control** | | | |
| View event buffer memory[27] | Esc X74, X75, X76, X77E← | X90↵ | |
| Write event buffer memory[24,27] | Esc X74, X75, X76, X78 X77E← | Evt X74, X75, X76, X78↵ | |
| **NOTE:** The response to the Write Event command is padded with leading zeros for X74 and X76. X74 = 5 digits; X76 = 10 digits. | | | |

| Command | ASCII Command (Host to Tuner) | Response (Tuner to Host) | Additional Description |
|---|---|---|---|
| **Event control (continued)** | | | |
| Write string to event buffer memory[24,27] | Esc*string**X74,X75,X76FE↵ | Evt X74,X75,X76, *string*↵ | |
| **NOTES:** F must be capitalized to read and write strings to event buffer memory.<br>The response to the Write String command is padded with leading zeros for X74 and X76. X74 = 5 digits; X76 = 10 digits.<br>The Write String command expects an escaped string. Strings returned by the device (read or write response) are binary (non-escaped) data. | | | |
| View string from event buffer memory[27] | EscX74,X75,X76,X80FE↵ | *String* | |
| Start events[24,27] | Esc1AE↵ | Ego↵ | |
| Stop events[24,27] | EscØAE↵ | Est↵ | |
| Query the number of events running | EscAE↵ | *nnnnn*↵<br>***In Verbose Mode:***<br>Enm *nnnnn*↵ | Response is a 5-digit number.<br>Telnet text responses:<br>*event0 starting loc, length*↵<br>*event1 starting loc, length*↵ |

# Accessing the AVT 200HD Configuration & Control Software

The Windows-based AVT 200HD Configuration & Control Program provides a convenient way to configure and control the tuner from your computer. All functions that are available from the front panel buttons and menus, SIS commands, and the embedded web pages are also available via this control program.

The control software is provided on a DVD with your AVT 200HD and is also available for downloading free of charge from the Extron website at **www.extron.com**.

## Computer System Requirements

The minimum system requirements for the computer on which you install the configuration and control program include:

- Intel® Pentium® III 1-GHz processor
- Microsoft Windows XP SP2 and Windows 7
- Microsoft.NET Framework 4.0 or higher
- 512 MB of RAM
- 50 MB of available hard disk space

## Downloading and Installing the Software from the Web

If you do not have the control software on disc, download it to your computer from the Extron website as follows:

1. Visit the Extron web site at **www.extron.com** and select the **`Download`** tab.
2. On the Download Center screen, click the **`Control Software`** button or the **`Software`** link on the left side panel.

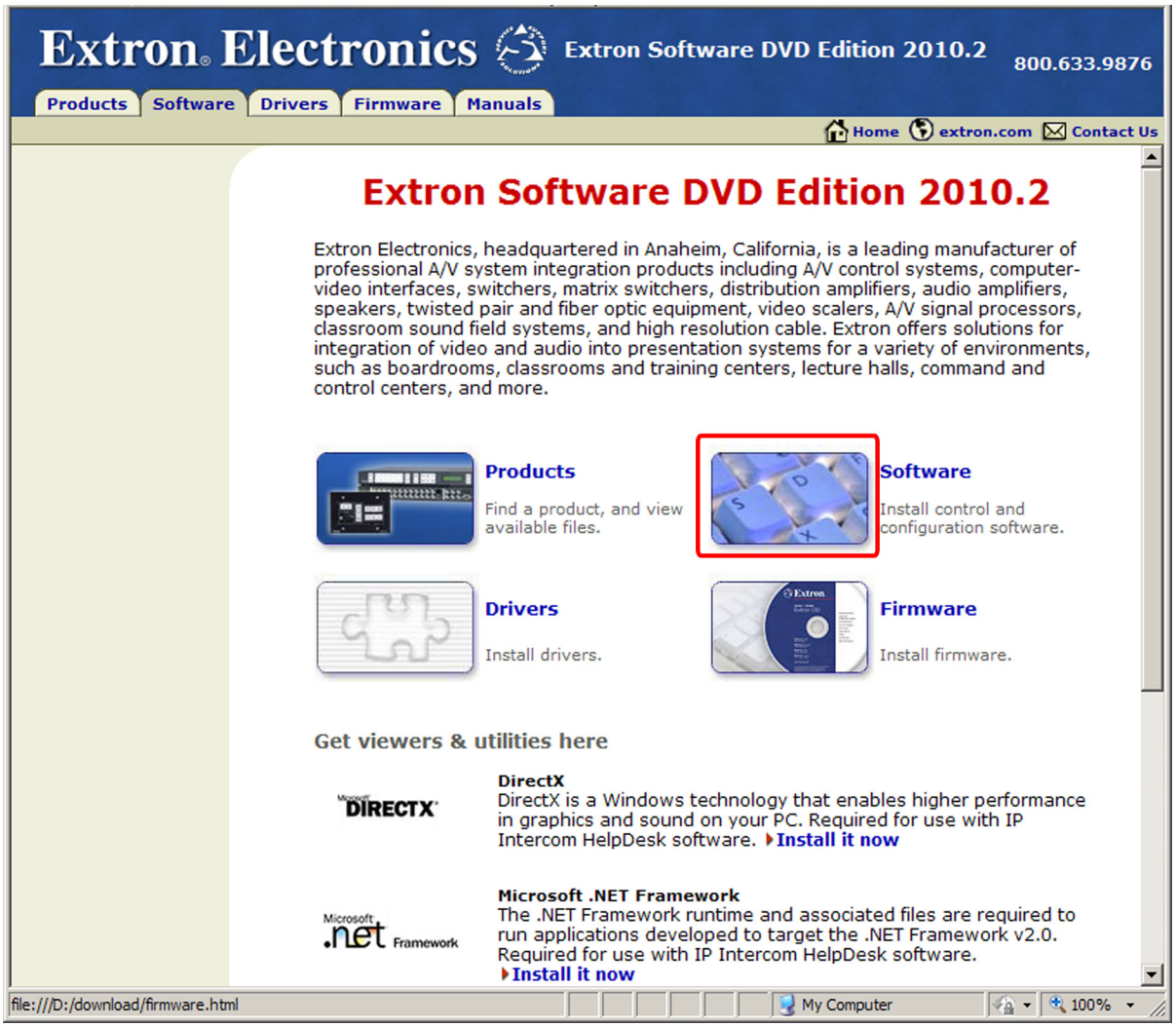
**Figure 36. Software Links on the Download Center Screen (Web)**

3. On the Control Software screen, click **A** on one of the linked alphabets at the top and bottom of the screen if necessary to display the "A" page.
4. Locate the AVT 200HD and click the **Download** link at the far right.
5. On the next screen, fill in the required information.
6. Click the **Download AVT2ØØHDV*nxn*.exe** button.
7. Follow the instructions on the download screens to download the software and install it on your computer.

## Installing the Software from the Disc

If you have an Extron disc containing the AVT 200HD software, install it on your computer as follows:

1. Insert the disk into your computer drive. If the disc does not start automatically, open your Windows Explorer and double-click **Launch.exe** on the disk drive to start it.
2. On the Extron software DVD screen, click the **Software** button.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Extron Electronics, headquartered in Anaheim, California, is a leading manufacturer of professional A/V system integration products including A/V control systems, computer-video interfaces, switchers, matrix switchers, distribution amplifiers, audio amplifiers, speakers, twisted pair and fiber optic equipment, video scalers, A/V signal processors, classroom sound field systems, and high resolution cable. Extron offers solutions for integration of video and audio into presentation systems for a variety of environments, such as boardrooms, classrooms and training centers, lecture halls, command and control centers, and more.
Products
Find a product, and view available files.
Software
Install control and configuration software.
Drivers
Install drivers.
Firmware
Install firmware.
Get viewers & utilities here
DirectX
DirectX is a Windows technology that enables higher performance in graphics and sound on your PC. Required for use with IP Intercom HelpDesk software. Install it now
Microsoft .NET Framework
The .NET Framework runtime and associated files are required to run applications developed to target the .NET Framework v2.0. Required for use with IP Intercom HelpDesk software.
Install it now
file:///D:/download/firmware.html
My Computer
100%

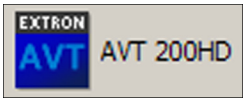
**Figure 37. Software Button on the DVD Opening Screen**

3. On the Control Software screen, locate the AVT 200HD, and click the **Install** link in the far right column.
4. Follow the on-screen instructions to complete the installation.

## Starting the Software

To run the AVT 200HD Configuration & Control Program:

1. Click on the **AVT200HD.exe** icon (shown at right) in the Extron Electronics group or folder in the **Start** menu. You can access this icon by selecting Start > All Programs > Extron Electronics > AVT 200HD > AVT 200HD.




After a few seconds, the Communication Setup window opens, in front of the control program main window.

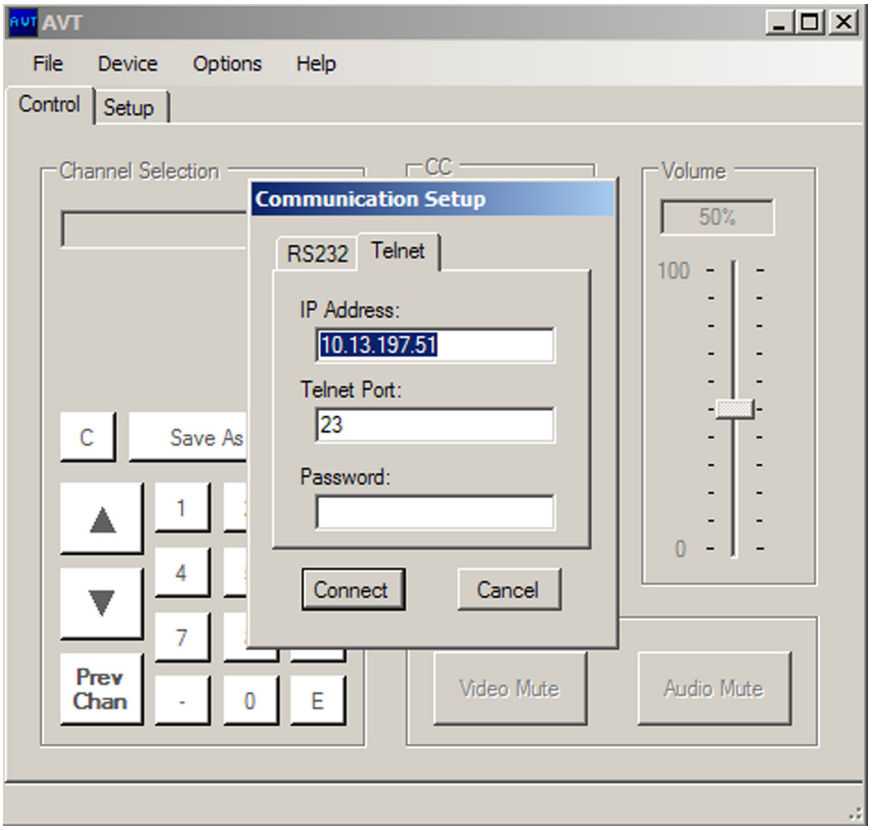



**Figure 38. Communication Setup Window with Telnet Tab**

2. On the Communication Setup screen, select the tab for the desired connection and enter the requested information:

   - **Telnet (shown above):** For an IP connection over Telnet, enter the IP address for your AVT, the Telnet port number (23 is the default), and the password if one has been set.

     **NOTE:** If your local system administrators have not changed the value, use the factory-specified default address, 192.168.254.254, in this field.

- **RS232 (shown below):** From the drop-down menus, select the port, baud rate (the default is **9600**), parity, data bits, and stop bits.

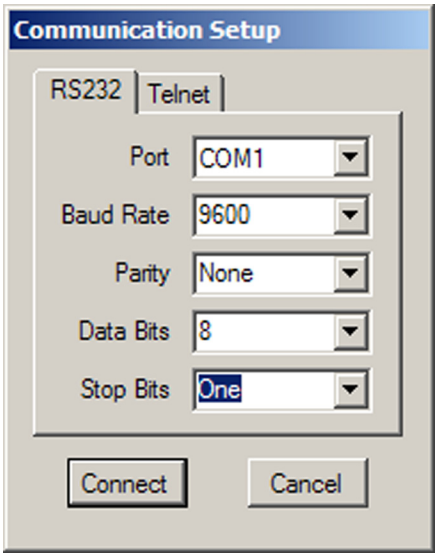



**Figure 39. RS232 Connection Tab**

3. Click **Connect**. A Getting Device Settings screen displays status messages while the software is opening.

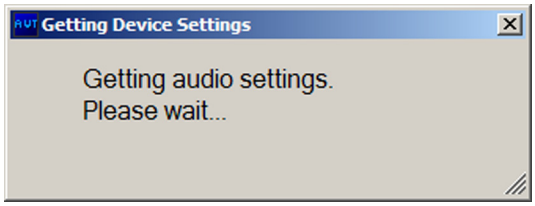



**Figure 40. Start-up Status Message Example**

The AVT 200HD Configuration & Control Program main window appears with the **Control** tab displayed (see the illustration on the next page). This tab shows the currently selected channel or preset and also contains function selection buttons and controls.

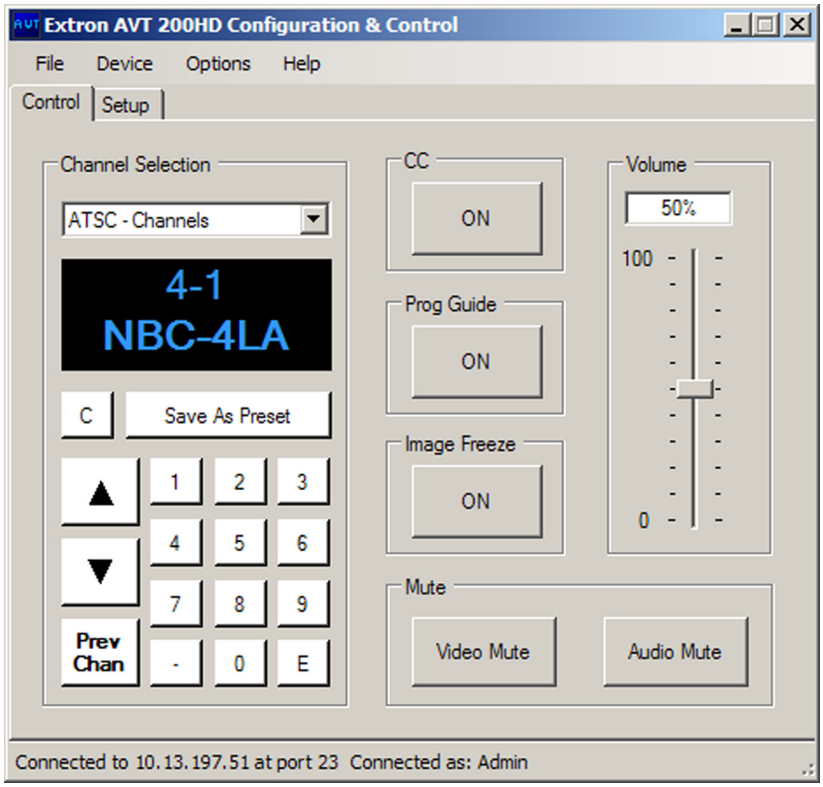



**Figure 41. AVT 200HD Configuration & Control Program Main Window with the Control Tab Displayed**

**4.** To begin configuring the AVT, click the **Setup** tab. This tab contains several sub-tabs on which you can set up all available AVT parameters.

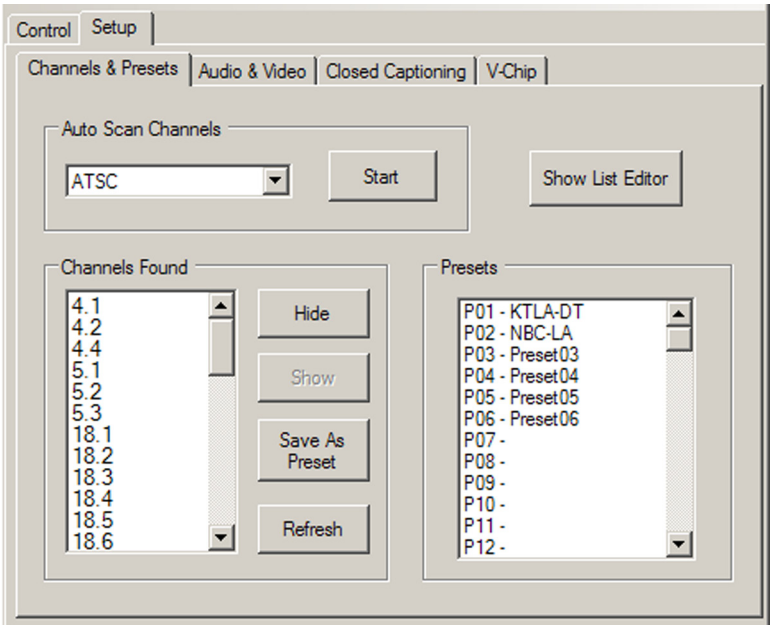



**Figure 42. Setup Tab on the Main Window**

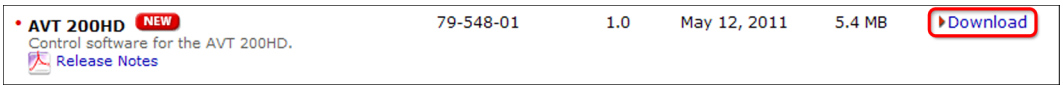
## Using the Configuration & Control Program Help File

For instructions on using the AVT 200HD Configuration & Control Program to set up and control the AVT, use the program help file. To access it, select **Help** from the **Help** menu.

## Updating the Firmware

The Firmware Loader utility provides a way to replace the AVT firmware. Update the firmware as follows:

1. Visit the Extron website, **www.extron.com**, and download the latest firmware file to your computer.
   a. On the Extron web page, select the **Download** tab.
   b. On the Download Center page, click the **Firmware** link on the left sidebar menu.
   c. On the list of available firmware files, locate the AVT 200HD and click the **Download** link at right.




   d. On the next screen, fill in the required information, then click the **Download AVT200HDFW*n*x*nn*.exe** button.
   e. On the next two File Download - Security Warning windows, click **Run**.

      If you want to save the firmware installer file to install the firmware on your computer later, click **Save** on these two windows. On the Save As window that opens, browse to the folder where you want to save the firmware installation file, and click **Save**. When you are ready to install the firmware on your computer, locate and double-click this installer file.
   f. Follow the instructions on the installation wizard screens to install the firmware on your computer. By default, the firmware file is placed in a folder at `C:\Program Files\Extron\Firmware\AVT 200HD` **or** `C:\Program Files (x86)\Extron\Firmware\AVT 200HD` (for Windows 7).
2. Start the AVT 200HD Configuration and Control Program.
3. From the **Device** menu, select **Update Firmware**. The main window minimizes and the Firmware Loader window opens.

   **NOTE:** For full instructions about using the Firmware Loader, select **Help** from the **Help** menu on the Firmware Loader window or press the <F1> key.

4. On the Firmware loader window, select your AVT 200HD name in the Devices section, if necessary.

5. Double-click on **<double click to set>** in the New Firmware File column, or select **New Firmware for Selected Devices** from the **File** menu.

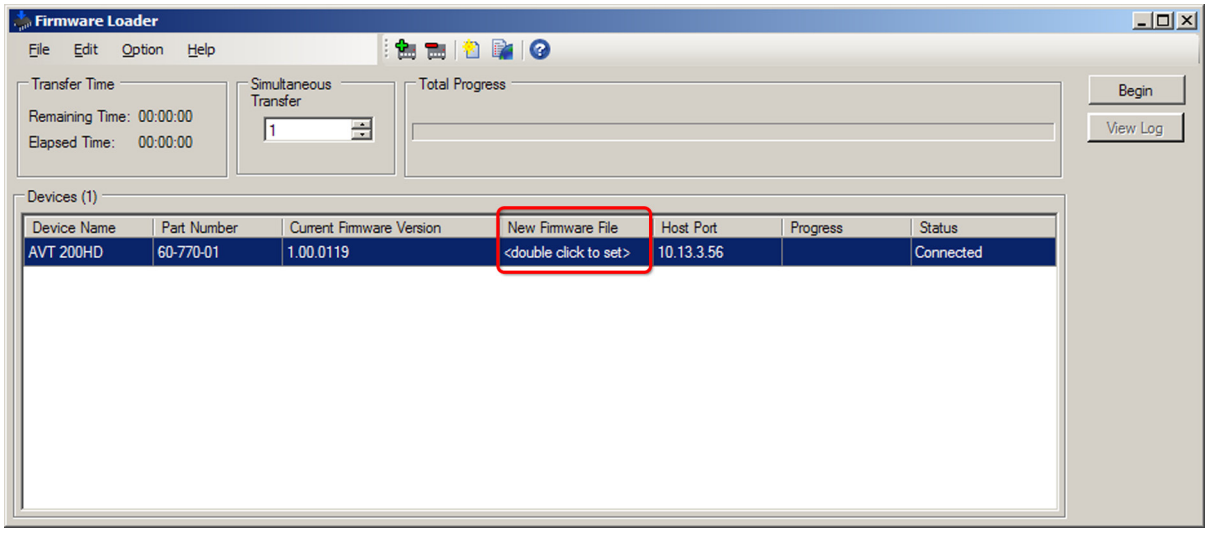



**Figure 43. Extron Firmware Loader Window for AVT 200HD**

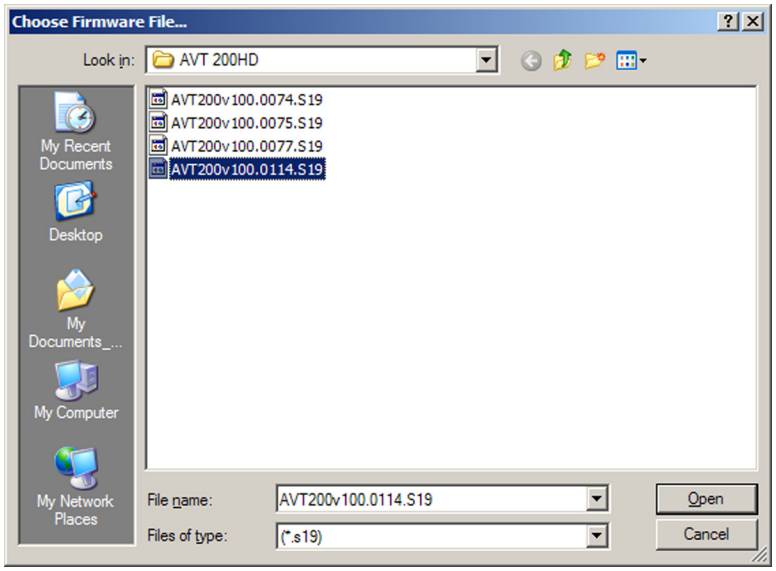



**Figure 44. Choose Firmware File Window**

6. In the Choose Firmware File window, navigate to and select the new firmware file, which has a **.s19** extension. Click **Open**. The Choose Firmware File window closes.

**CAUTION:** Valid firmware files must have the file extension ".S19." Any other file extension is not a firmware upgrade, and could cause the AVT to stop functioning.

**NOTE:** The original factory-installed firmware is permanently available on the AVT 200HD. If the attempted firmware upload fails for any reason, the tuner reverts to the factory-installed firmware.

7. In the Firmware Loader window, click **Begin**. The following indicators on the Firmware Loader window show the progress of the update:
   - The **Transfer Time** field shows the amounts of remaining and elapsed time for the update.
   - The **Total Progress** field displays a status bar with **Uploading...** above it.
   - In the **Devices** section, the **Progress** column displays an incrementing percentage and the **Status** column displays **Uploading**.

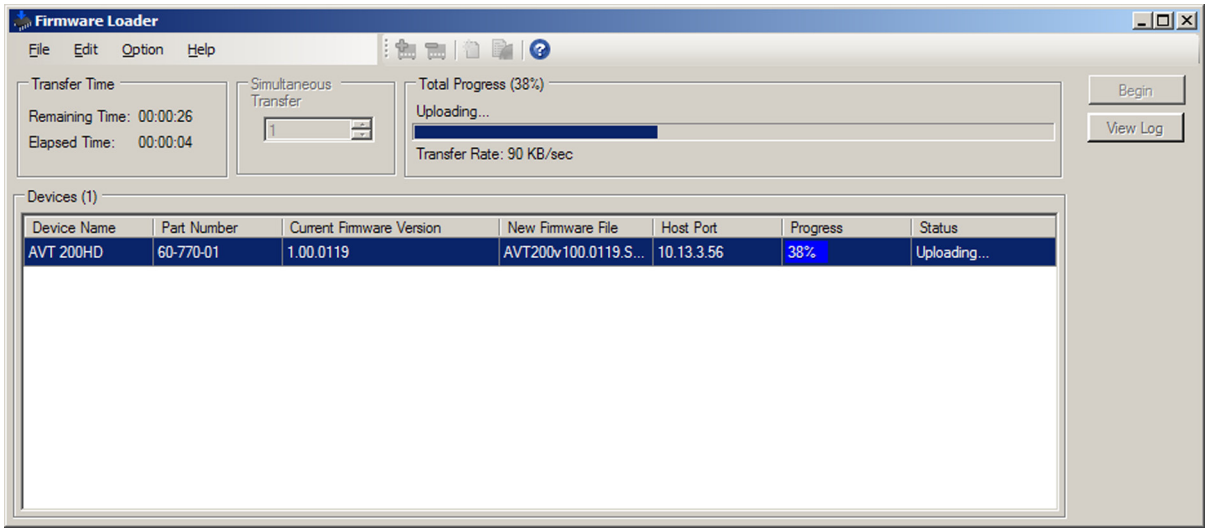



**Figure 45. Firmware Update in Progress**

When the upload is complete, the **Remaining Time** field shows **00.00.00**, the **Progress** column shows **100%**, and **Completed** is displayed above the progress bar and in the **Status** field.

At this point, the AVT resets itself. The LCD screen on the unit displays **REBOOTING PLEASE WAIT...** . When the reset is complete, the LCD screen returns to the default cycle.

8. When the firmware upload and unit reset are complete, close the Firmware Loader window. The AVT 200HD Configuration & Control Program main window is redisplayed.

# HTML Configuration and Control

This section provides procedures for accessing and using the AVT embedded web pages. The following topics are included:


- **Accessing the Web Pages**
- **Special Characters**
- **System Status Page**
- **Configuration Pages**
- **File Management Page**
- **Control Pages**


The AVT can be controlled and operated through its Ethernet port, connected via a LAN or WAN and using a web browser such as Microsoft Internet Explorer®. The browser displays the AVT web pages, which provide an alternative means of configuring and operating the tuner. These factory-installed web pages are always available and cannot be erased or overwritten.

> **NOTE:** If your Ethernet connection to the tuner is unstable, try turning off the proxy server in your web browser. To do this in Microsoft Internet Explorer, click **`Tools`** > **`Internet Options`** > **`Connections`** > **`LAN Settings`**, clear the **`Use a proxy server...`** check box, then click **`OK`**.

## Accessing the Web Pages

Access the HTML pages as follows:

1. Start the web browser program.
2. Click in the browser **`Address`** field and enter the IP address of your AVT.

   > **NOTE:** If the local system administrators have not changed the value, use the factory-specified default `192.168.254.254` in this field.

3. If you want the browser to display a page other than the default page (such as a custom page that you have uploaded), enter a slash (**/**) following the IP address and the name of the file to open.

   > **NOTE:** The browser **`Address`** field should display the IP address in the following format: *nnn.nnn.nnn.nnn/`optional_file_name`*.html.

4. Press the <Enter> key. The tuner checks to see if it is password protected.
   - If the tuner is not password protected, the System Status web page opens.
   - If the AVT is password protected, the network password dialog box is displayed.

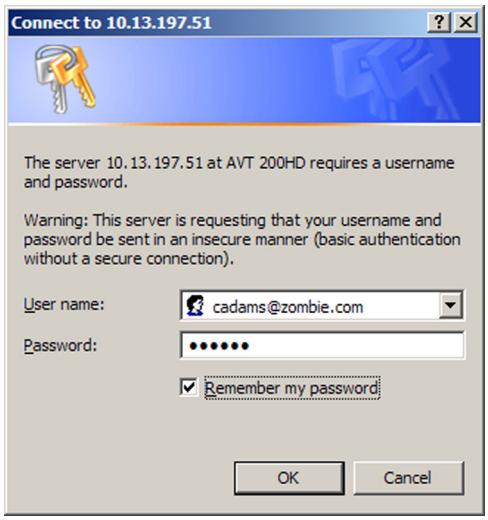

Connect to 10.13.197.51
The server 10.13.197.51 at AVT 200HD requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
cadams@zombie.com
Password:
Remember my password
OK
Cancel

**Figure 46. Example of a Network Password Dialog Box**

5. If an administrator or user password is required, enter it in the **Password** field. If desired, select the check box to have the system input your password the next time you enter your AVT IP address. Click **OK**.

   **NOTE:** A **User name** entry is not required.

   The AVT 200HD checks several possibilities, in the following order, and then responds accordingly:
   - If the address includes a specific file name, such as 10.13.156.10/*file_name*.html, the tuner downloads that HTML page.
   - If there is a file in the AVT memory that is named "index.html," the tuner downloads "index.html" as the default startup page.
   - **If neither of the above conditions is true**, the tuner downloads the factory-installed default startup page, "nortxe_index.html," also known as the System Status page.

## Special Characters

The HTML language reserves certain characters for specific functions. The AVT does not accept these characters as part of preset names, the tuner name, passwords, or locally created file names.

The following characters are invalid or not recommended:
**+ ~ , @ = ` [ ] { } < > ' ' " " ; : | \ ?** and **space**.

## System Status Page

The System Status page provides an overall view of the status of the tuner, including firmware version and serial port settings. The System Status page is the default page that the tuner downloads when you connect to it. You can access the System Status page from other pages by clicking the **Status** tab.

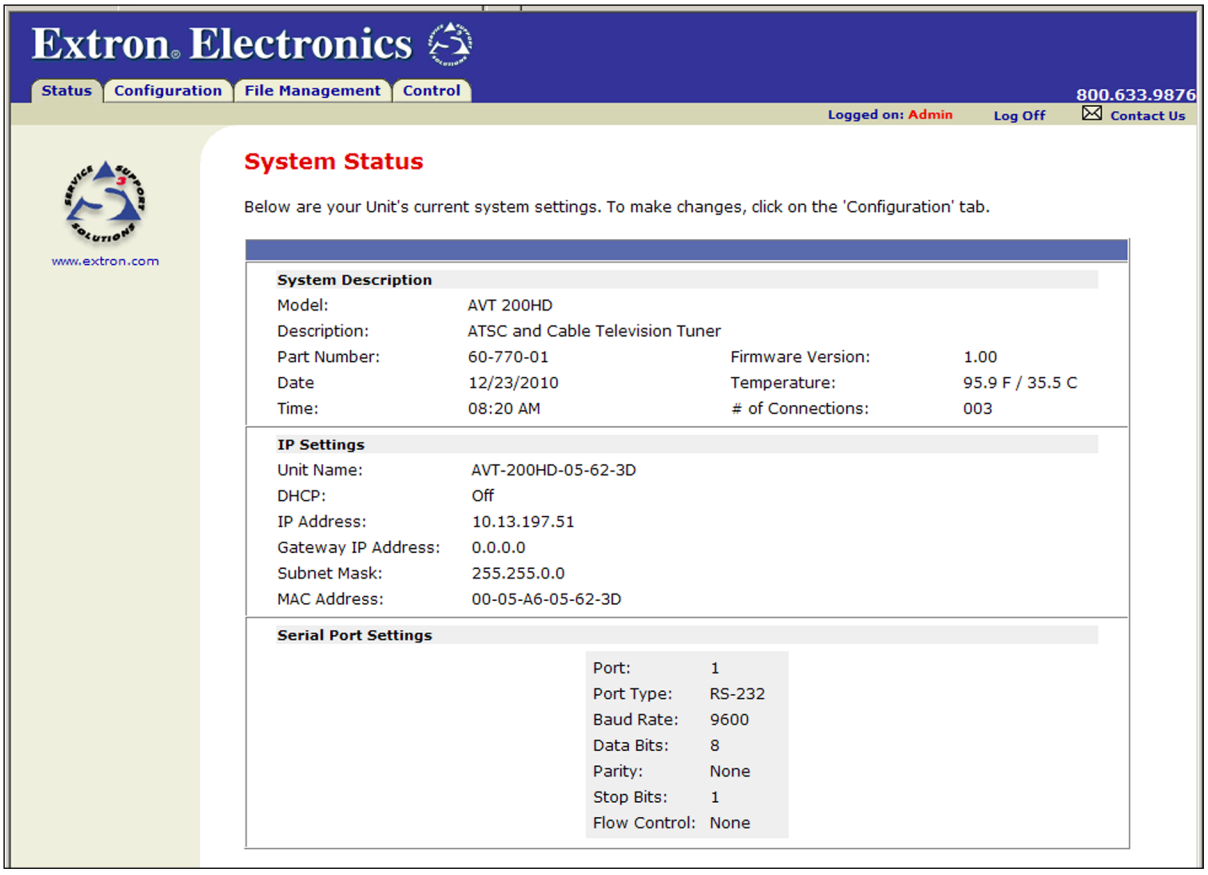



**Figure 47. System Status Page**

The System Status web page refreshes itself periodically to reflect the latest status of the tuner components. If a variable changes, the display shows the change in status the next time it updates.

# Configuration Pages

The **Configuration** tab contains enables you to four pages that only an administrator can access. These pages are listed in the left sidebar menu on the **Configuration** tab. The following sections describe the changes you can make from these pages.

## System Settings Page

The AVT 200HD displays the System Settings page (shown on the next page) when you click the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings. The Tuner Settings, Passwords, and Firmware Upgrade pages can be accessed by clicking the appropriate link on the left sidebar menu. See "**IP Addressing**" in the "Reference Information" section for basic information about IP addresses and subnetting.

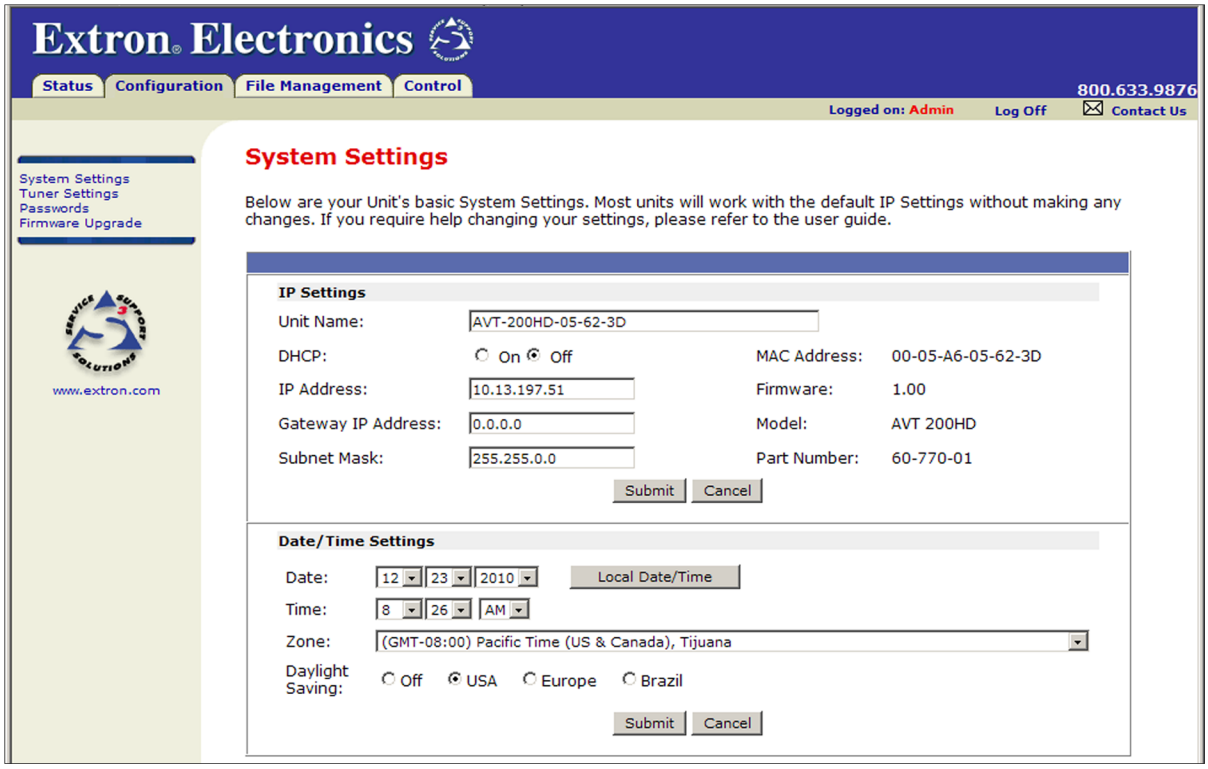



**Figure 48. System Settings Page**

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all tuning capabilities and editing functions. Users can select channels, save and recall presets, and view all settings with the exception of passwords.

- Ethernet connection to the tuner, either entering SIS commands (see the "**Using SIS Commands**" section) or using the AVT 200HD Configuration & Control Program (see the control program help file) is password protected.
- Connection via the RS-232 port is not password protected.

## IP Settings Fields

The **IP Settings** fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the **Submit** button at the bottom of the **IP Settings** section.

### *Unit Name field*

The **Unit Name** field contains the name used as the "from" information when the AVT e-mails notification of its failed or repaired status. You can change this name field to any **valid name**, up to 24 alphanumeric characters.

### *DHCP radio buttons*

The **DHCP On** radio button directs the tuner to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable).

The **DHCP Off** radio button turns DHCP off.

Contact your local system administrator for this setting.

### *IP Address field*

The **IP Address** field contains the IP address of the connected AVT. This address is encoded in the tuner flash memory.

Valid IP addresses consist of four one-, two-, or three-digit numeric sub-fields separated by periods. Each field can be numbered from 000 through 255. Leading zeros, up to three digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

**NOTE:** IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.

### *Gateway IP Address field*

The **Gateway IP Address** field identifies the address of the gateway (to the mail server) to be used if the tuner and the mail server are not on the same subnet.

The gateway IP address has the same validity rules as the system IP address (see "**IP Address field**," above).

### *Subnet Mask field*

The **Subnet Mask** field is used to determine whether the tuner is on the same subnet as the mail server when you are using a subnet (see "**Subnetting — A Primer**" under "Ethernet Connection" in the "Reference Information" section for more information).

The subnet mask address has the same validity rules as the system IP and gateway IP addresses.

### *MAC Address field*

The MAC (media access control) address is a unique hardware address by which each individual AVT can be identified. It consists of six pairs of characters separated by hyphens. For all Extron products, the first three character pairs are 00-05-A6, followed by three more pairs unique to the individual device. The MAC address is hard coded in the tuner and cannot be changed.

## Date/Time Settings Fields

The fields in the Date/Time Settings section let you view and set date and time parameters.

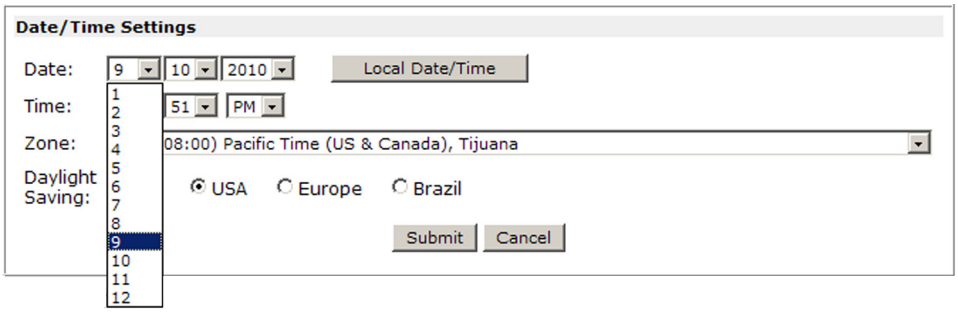



**Figure 49. Date/Time Settings Fields**

Change the date and time settings as follows:

1. In each Date or Time field that you want to change, select the desired value from the drop-down menu or type it in the field. (The **Month** drop-down box is selected in the figure above); **or**

   Click the **Local Date/Time** button to set the date and time to your local settings.

2. From the **Zone** menu, select your time zone. The selection displayed in the **Zone** field identifies the standard time zone and the amount of time, in hours and minutes, that local time varies from the Greenwich Mean Time (GMT) international time reference.

3. If daylight saving time is currently in effect in your area, select the radio button for the area. If daylight saving time is not in effect or is not observed, select **Off**.

   **NOTE:** When daylight savings time is enabled, the scaler updates its internal clock between standard time and daylight savings time in the spring and fall on the date that the time change occurs in the United States of America, parts of Europe, or parts of Brazil. When daylight savings time is turned off, the tuner does not adjust its time reference.

4. Click the **Submit** button at the bottom of the **Date/Time Settings** section to implement your selections.

## Tuner Settings Page

On the Tuner Settings page, you can show or hide scanned channels, select the signal source (over-the-air or cable), scan and hide channels, save and recall presets, select the output resolution, and enable or disable front panel lockout (executive mode). To display the Tuner Settings page, click the **`Configuration`** tab, then select the **`Tuner Settings`** link on the left sidebar panel.

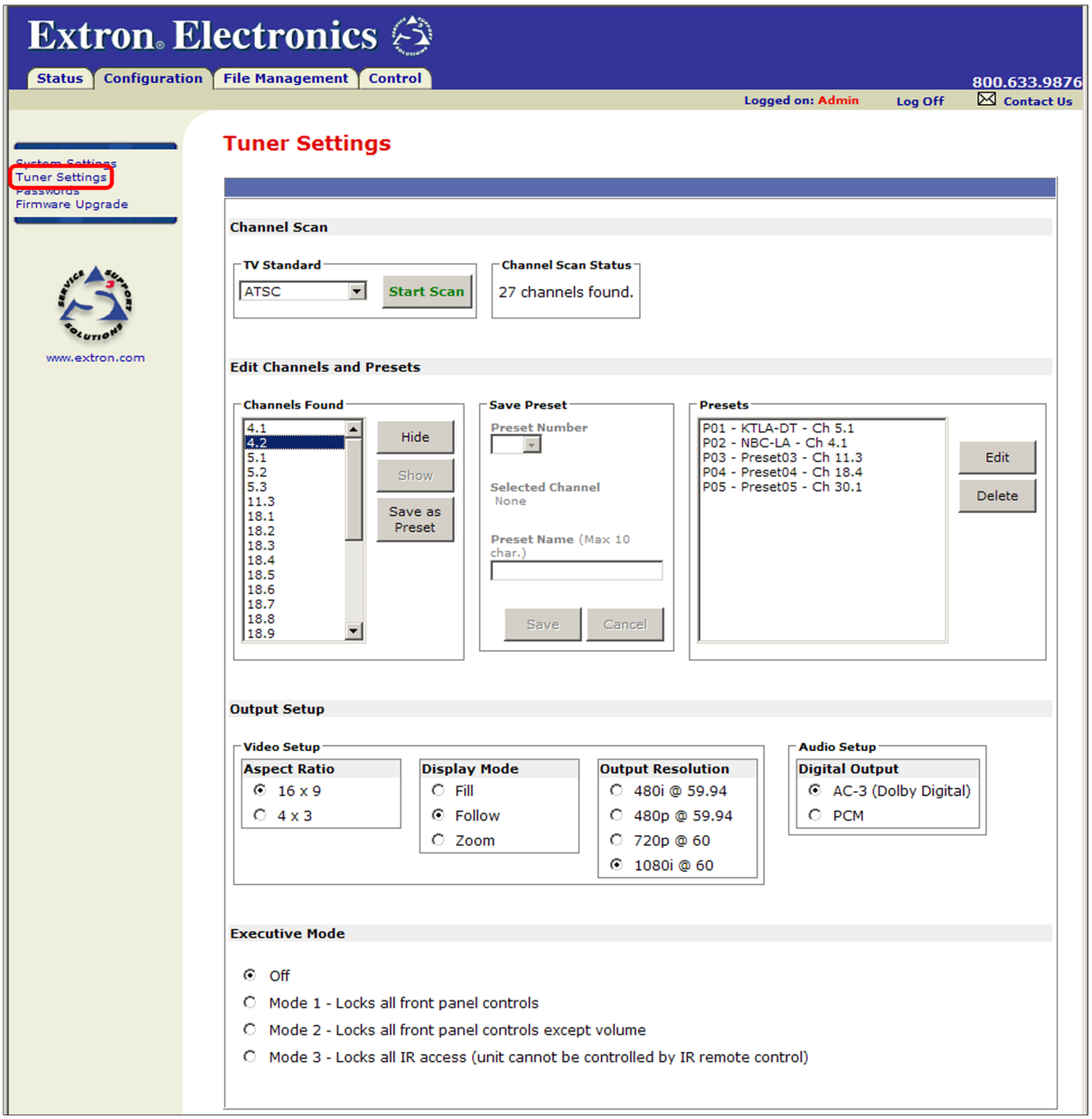



**Figure 50. Tuner Settings Page**

Set up your AVT 200HD for operation by making selections in the following sections on this web page.

## Channel Scan section

In this section you can select the signal source (ATSC or cable) and initiate scanning for all channels in your area with active signals. To scan for channels using this screen:

1. From the **TV Standard** drop-down menu, select the desired signal source.

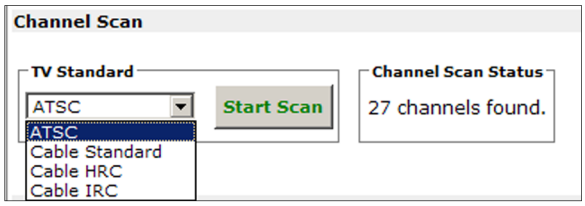


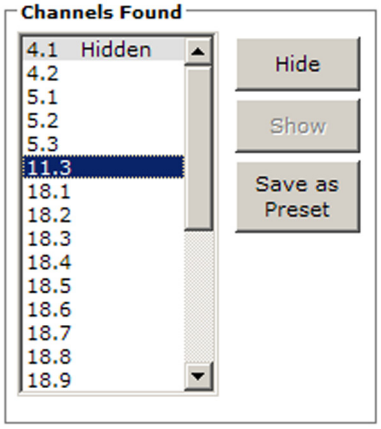

**Figure 51. Channel Scan Section of Tuner Settings Page**

2. Click **Start Scan**. The AVT scans for active channels and saves them to memory. The Channel Scan Status field displays the number of channels saved.

## Edit Channels and Presets section

In this section, you can hide or show channels found in the scan and save channels to presets. You can also edit and delete saved presets.

### *Hiding and showing channels*




When you hide a channel, it does not appear in the LED and LCD displays on the front panel.

**To hide a channel:**

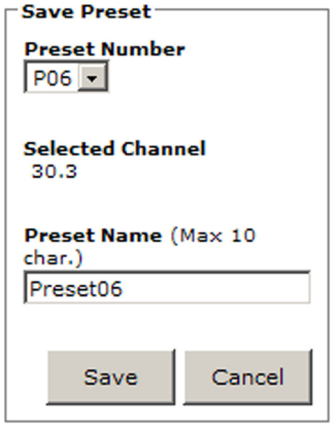
1. From the **Channels Found** list, select the channel number to hide.
2. Click the **Hide** button. On the **Channels Found** list, the channel number is followed by **Hidden**.

**To show a hidden channel:**

3. From the Channels Found list, select a hidden channel number. The **Show** button becomes accessible.
4. Click **Show**. The **Hidden** designation is removed from the selected channel.

### *Saving a preset*

To save a channel as a preset:

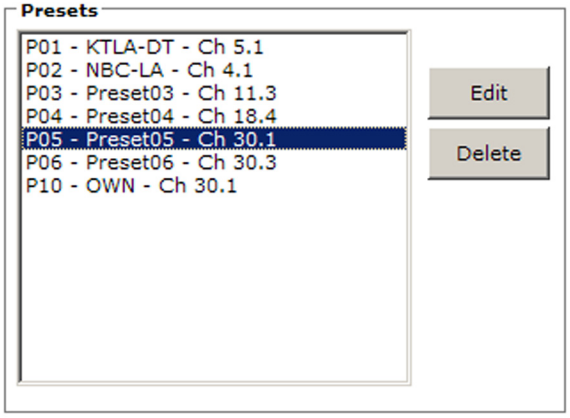



1. From the **Channels Found** list, select the channel that you want to save as a preset.
2. Click the **Save as Preset** button. The fields in the Save Preset section are activated and the Selected Channel field is populated with the channel number you selected in step **1**.
3. In the Save Preset section, select an available preset number from the drop-down menu.
4. If desired, enter a name for the preset in the **Preset Name** field. (By default, the name is shown as **Preset***nn*, where *nn* is the preset number.)
5. Click **Save**. The saved preset is added to the Presets list at right. (The newest preset is shown in blue until the page is refreshed or a new preset is added.)

### *Editing or deleting a preset*

To edit a preset:

1. In the Presets section, select a preset to edit.
2. Click the **Edit** button. The preset number, channel number, and name of the selected preset are displayed in the Save Preset section.
3. In the Save Presets fields, make the desired changes to the preset number or name. (You cannot change the channel number.)
4. In the Save Preset section, click **Save**. The changes to the preset appear in the Presets list.


Presets
P01 - KTLA-DT - Ch 5.1
P02 - NBC-LA - Ch 4.1
P03 - Preset03 - Ch 11.3
P04 - Preset04 - Ch 18.4
P05 - Preset05 - Ch 30.1
P06 - Preset06 - Ch 30.3
P10 - OWN - Ch 30.1
Edit
Delete

**NOTE:** If you change a preset **number**, a new preset is added for the same channel. It does not replace the existing preset for that channel. In the example above, channel 30.1 is now saved as two presets: P05 and P10.

To delete a preset:

1. In the Presets section, selected the preset to be deleted.
2. Click the **Delete** button. The selected preset name is removed from the list and from AVT memory.

## Output Setup section

In this section, select the radio buttons as desired for the following video and audio settings:

- Aspect Ratio (16x9 or 4x3)
- Display Mode:
  - **Fill** — The image fills a 16x9 screen. If the video image is 4x3, it is stretched horizontally to fit the larger screen.
  - **Follow** (default) — The aspect ratio of the output image follows that of the source (also called "normal" mode).

    A 4x3 video image is framed to a 16x9 display area, retaining its original aspect ratio but with vertical gray or black bars on both sides of the screen. A 16x9 image is framed to a 4x3 area, with its original aspect ratio but with horizontal gray or black bars at the top and bottom of the screen.
  - **Zoom** — The image is evenly stretched both horizontally and vertically, until the picture fills the entire width of the screen.
- Output Resolution (video)
- Digital Output (audio)

## Executive Mode

Select the radio button for the desired front panel lock mode or select **Off** to disable executive mode.

## Passwords Page

Access the Passwords page by clicking the **Passwords** link on the sidebar menu on the System Settings page.

Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
System Settings
Tuner Settings
Passwords
Firmware Upgrade
www.extron.com
Passwords
To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters. Passwords are case sensitive and special characters are not allowed.
Passwords
Administrator Password:
Re-enter Admin Password:
User Password:
Re-enter User Password:
Submit
Cancel

**Figure 52.** Passwords Page

### Setting a password

The fields on the Passwords page are used to enter and verify administrator and user passwords. Passwords are case-sensitive and are limited to 12 upper- and lowercase alphanumeric characters.

1. Enter the new administrator password in the **Administrator Password** field.
2. In the **Re-enter Admin Password** field, enter the same password to confirm it.
3. If you want to assign a user password, enter it in the **User Password** and **Re-enter User Password** fields.

   **NOTE:** An administrator password must be created before a user password can be assigned.

4. Click the **Submit** button to set the passwords.

Characters in the password fields are masked by four bullets (••••). If you do not want to password-protect an access level, leave the **Password** and the **Re-enter Password** fields blank.

### Removing passwords

To clear an existing password so that no password is required, delete the bullets in the **Password** and **Re-enter Password** fields and enter a space in each field, then click the **Submit** button at the bottom of the page.

## Firmware Upgrade Page

The Firmware Upgrade page lets you replace the firmware that is coded on the AVT control board without needing to take the tuner out of service. Access the Firmware Upgrade page by clicking the **Firmware Upgrade** link on the System Settings page.

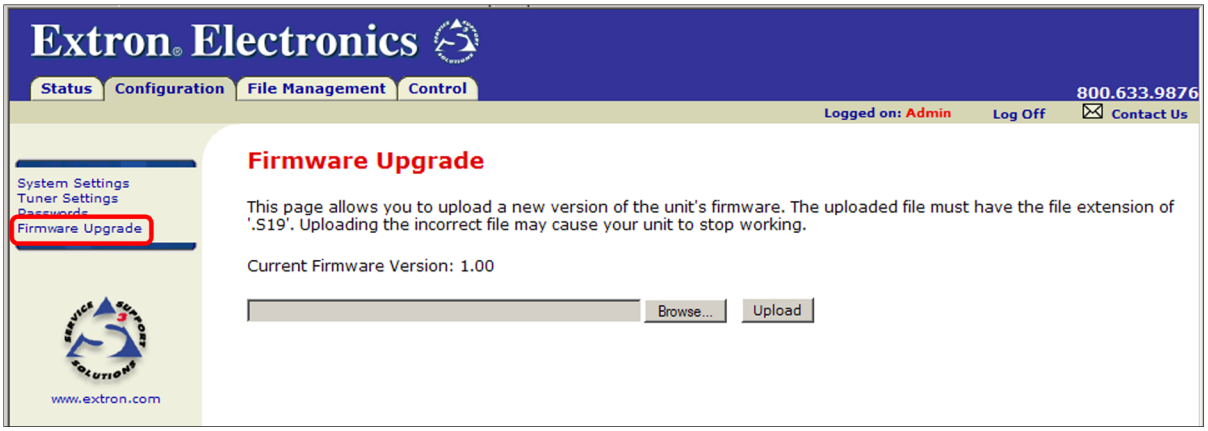



**Figure 53. Firmware Upgrade Page**

To update firmware using the Firmware Upgrade page:

1. Visit the Extron website, **www.extron.com**, and download the latest firmware file to your computer.
   a. On the Extron web page, select the **Downloads** tab.
   b. On the Download Center page, click the **Firmware** link on the left sidebar menu.
   c. Click on the name of your AVT 200HD.
   d. On the next screen, fill in the required information, then click the **Download AVT2ØØHDV*n*x*nn*.exe** button.
   e. On the File Download – Security Warning window, click **Save**.
   f. On the Save As window, browse to the folder where you want to save the firmware file, and click **Save**. The firmware installation file is placed on your computer hard drive.
2. Access the AVT web pages.
3. Select the **Configuration** tab.
4. On the Configuration page, click the **Firmware Upgrade** link on the left side.

5. Click the **Browse** button. A Choose File to Upload window opens.

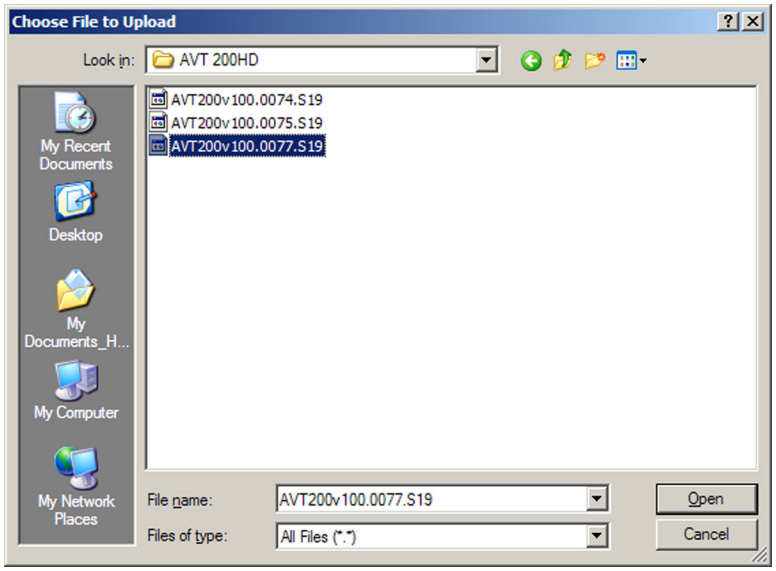



**Figure 54. Choose File Window with a Firmware File Selected**

6. Navigate to the folder where you saved the firmware upgrade file and double-click on the file name. The Choose Firmware File window closes, and the path to the new firmware file is displayed in the "**Current Firmware Version** *n.nn*" field on the Firmware Upgrade page.

**CAUTION:** Valid firmware files must have the file extension ".S19." A file with any other extension is **not** a firmware upgrade for this product. Uploading files with a different extension could cause the AVT to stop functioning.

**NOTE:** The original factory-installed firmware is permanently available on the AVT 200HD. If the attempted firmware upload fails for any reason, the AVT reverts to the factory-installed firmware.

7. On the Firmware Upgrade page, click the **Upload** button.

While the firmware is uploading, the **Upload** button changes to **Uploading...** . When the uploading process is complete, the button changes back to **Upload**. (The uploading may take a few minutes.)

# File Management Page

The File Management page is a useful tool that allows you to use and upload existing and custom web pages. Custom pages can be developed using a third-party web page development program such as Microsoft Office FrontPage or Adobe® Dreamweaver®. File management also allows you to remove unnecessary or outdated files when they are no longer needed.

To access this page, click the **File Management** tab.

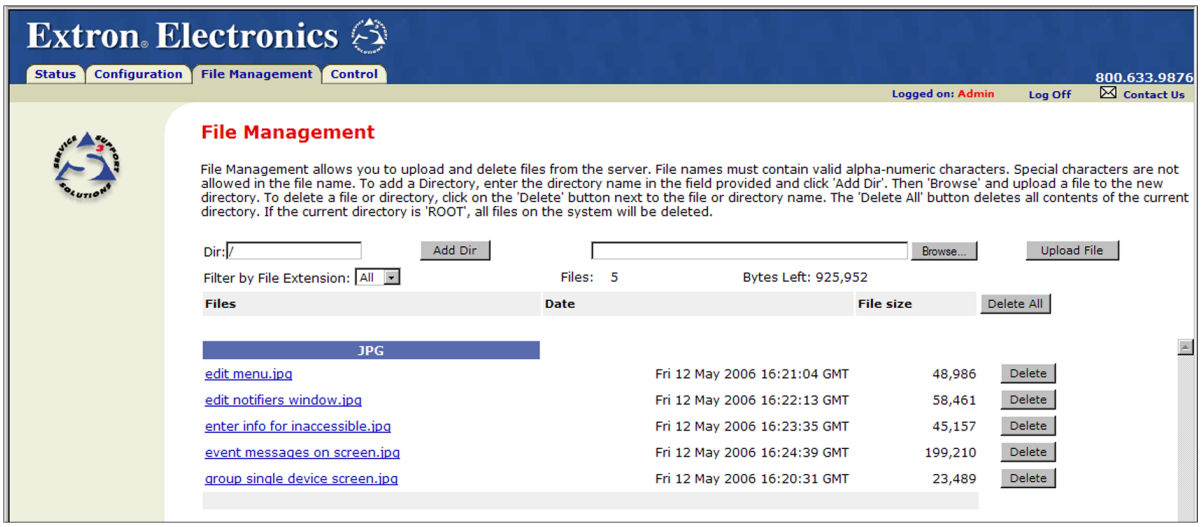

Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
File Management
File Management allows you to upload and delete files from the server. File names must contain valid alpha-numeric characters. Special characters are not allowed in the file name. To add a Directory, enter the directory name in the field provided and click 'Add Dir'. Then 'Browse' and upload a file to the new directory. To delete a file or directory, click on the 'Delete' button next to the file or directory name. The 'Delete All' button deletes all contents of the current directory. If the current directory is 'ROOT', all files on the system will be deleted.
Dir:/
Add Dir
Browse...
Upload File
Filter by File Extension: All
Files: 5
Bytes Left: 925,952
Files
Date
File size
Delete All
JPG
edit menu.jpg
Fri 12 May 2006 16:21:04 GMT
48,986
Delete
edit notifiers window.jpg
Fri 12 May 2006 16:22:13 GMT
58,461
Delete
enter info for inaccessible.jpg
Fri 12 May 2006 16:23:35 GMT
45,157
Delete
event messages on screen.jpg
Fri 12 May 2006 16:24:39 GMT
199,210
Delete
group single device screen.jpg
Fri 12 May 2006 16:20:31 GMT
23,489
Delete

**Figure 55. File Management Page**

**NOTE:** The files listed in the figure above are shown for example only and may not be present on your tuner.

## Uploading Files

Files to be uploaded to the AVT must contain only **valid alphanumeric characters** and underscores.

To upload files from the server, follow these steps:

1. Click the **Browse** button to the right of the file name field.
2. Browse to locate the file that you want to upload, and open it. The file name and directory path are displayed in the file name field on the File Management page.
3. Click the **Upload File** button. The selected file name appears in the **Files** column on the File Management page. (Files are listed separately under headings of their extensions.)

**NOTE:** If you want one of the pages that you create and upload to be the default startup page, name that file "index.html."

## Adding a Directory

To add a directory or folder to the AVT file system:

1. Enter the directory name in the **Dir:** field, following the slash (/).
2. Click the **Add Dir** button.
3. With the directory name displayed, perform the **uploading files** procedure described earlier in this section to add a file to the directory. The directory name appears at the top of the Files column, preceded by a slash (/).

To add more files to the directory, click the directory name to open it, then perform the **uploading files** procedure. To exit the directory, click **(root)** or **(back)**.

## Other File Management Activities

You can also perform the following tasks on the File Management screen:

- **Open a file** — Click on the name of the file in the Files column.
- **Delete a file** — Click the **Delete** button at the right end of the line that contains the file you want to remove.
- **Delete all files** — Click the **Delete All** button.
- **Display files by file extension** — The **Filter by File Extension** menu lists the extensions of the files that have been uploaded to the AVT. This menu lets you choose to display only files with the extension you select. Select **All** to display all uploaded files.

# Control Pages

From the **Control** tab, you can access the pages that allow you to set some special features of the AVT 200HD.

## User Control

On the User Control page, you can select channels or presets, mute and unmute audio and video outputs, turn closed captioning on and off, freeze and unfreeze the image on the screen, and open or close the on-screen Program Guide. To access the User Control page, select the **Control** tab, then click **User Control** in the left sidebar menu.

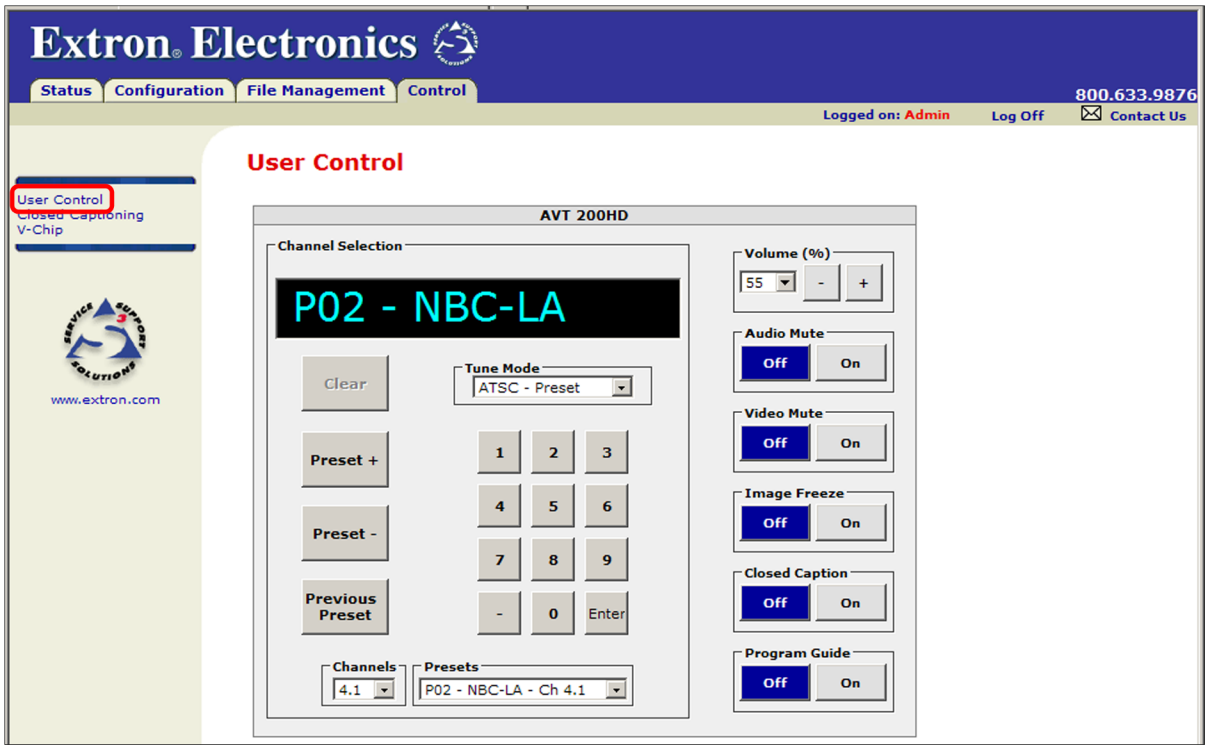
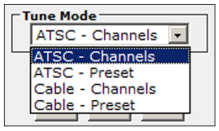



**Figure 56.** User Control Page

### Selecting tune or preset mode

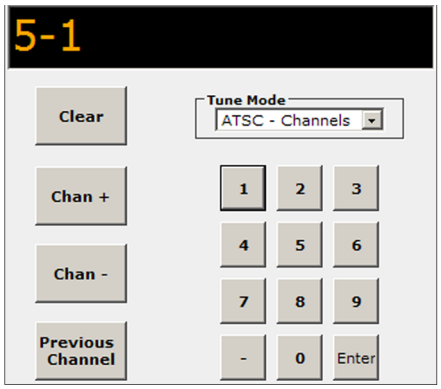



- To enable tune mode, select either **ATSC - Channels** or **Cable - Channels** from the **Tune Mode** drop-down menu (shown at right).
- To enable preset mode, select **ATSC - Preset** or **Cable - Preset** from the **Tune Mode** menu.

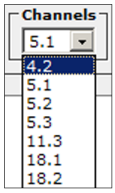
## Selecting a channel

To tune to a channel using the User Control page:

1. Make sure that the AVT is in tune mode (see "**Selecting tune or preset mode**", on the previous page).
2. Specify the channel number by any of the following methods:



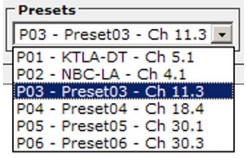

   - **Keypad —**
     a. On the number keypad, click the button for each digit of the channel number. Use the hyphen (**-**) in place of the decimal point. The numbers you click appear in orange in the display above the keypad. If you want to clear all the numbers displayed in orange, click the **Clear** button.
     b. Click **Enter** on the keypad. The selected channel number is displayed in cyan.
   - **Chan + and Chan – buttons** — Click either of these buttons to increment or decrement the selected channel number.
   - **Previous Channel button** — Click this button to select the previously selected channel.
   - **Channels menu** — Select the desired channel number from the **Channels** drop-down menu (shown at right).




## Selecting a preset

To select a preset using the User Control page:

1. Make sure that the AVT is in preset mode (see "Selecting tune or preset mode", above).
2. Select a preset by any of the following methods:
   - **Keypad —**
     a. On the number keypad, click the number of the desired preset (1, 20, 32, and so forth; leading zeros are ignored). The numbers you click appear in orange in the display above the keypad.
     b. Click **Enter** on the keypad. The preset number and name are displayed in cyan.
   - **Preset + and Preset – buttons** — Click either of these buttons to increment or decrement the selected preset number.
   - **Previous Channel button** — Click this button to select the previously selected preset.
   - **Presets menu** — Select the desired channel number from the **Presets** drop-down menu (shown at right).


Presets
P03 - Preset03 - Ch 11.3
P01 - KTLA-DT - Ch 5.1
P02 - NBC-LA - Ch 4.1
P03 - Preset03 - Ch 11.3
P04 - Preset04 - Ch 18.4
P05 - Preset05 - Ch 30.1
P06 - Preset06 - Ch 30.3

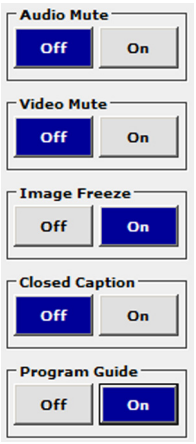
## Adjusting the volume

In the Volume (%) section, you can increase or decrease the output volume by either of the following methods:

- Select the volume percentage (**Ø** through **1ØØ**) from the drop-down menu.
- Click the **–** or **+** button to raise or lower the volume by one percentage point.

### Enabling or disabling audio or video muting, image freeze, closed captioning, and the Program Guide

To enable or disable muting, image freezing, closed captioning, or the Program Guide, click the **Off** or **On** button under the name of the function that you want to turn on or off.




## Closed Captioning Page

On this page, you can select a closed captioning service and specify the appearance of the closed caption screens on the display. Access the Closed Captioning page by clicking the **Closed Captioning** link on the sidebar menu of the Control page.

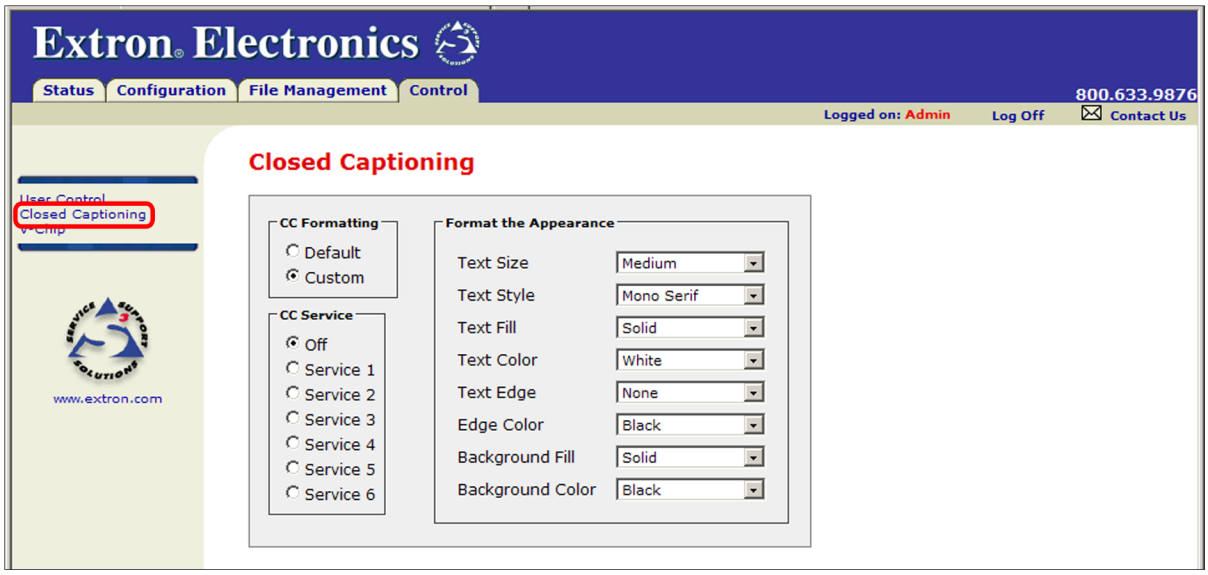



**Figure 57. Closed Captioning Page**

To select and format the closed captions, make your selections in the following fields:

- **CC Formatting** — Select the **Default** radio button to format the closed caption using the service default settings. When this button is selected, the drop-down menus in the Format the Appearance section are grayed out and unavailable.

  To format the text and background of the closed caption, select **Custom**. The menus in the Format the Appearance section become available.

- **CC Service** — Select the radio button for the desired closed captioning service number (**1** through **6**). To disable closed captioning, select **Off**.

- **Format the Appearance** — To specify the text and background parameters for the closed caption, make your selections from the following menus:

| Text Size | Text Style | Text Fill | Text Color |
|---|---|---|---|
| Small | Undefined | Solid | White |
| Medium | Mono Serif | Transparent | Black |
| Large | Prop. Serif | Translucent | Red |
| | Mono Sans Serif | Flash | Green |
| | Prop. Sans Serif | | Blue |
| | Casual | | Yellow |
| | Cursive | | Magenta |
| | Small Caps | | Cyan |

| Text Edge | Edge Color | Background Fill | Background Color |
|---|---|---|---|
| None | White | Solid | White |
| Raised | Black | Transparent | Black |
| Depressed | Red | Translucent | Red |
| Uniform | Green | Flash | Green |
| Left Shadow | Blue | | Blue |
| Right Shadow | Yellow | | Yellow |
| | Magenta | | Magenta |
| | Cyan | | Cyan |

## V-Chip Page

The V-chip provides a means of blocking movies and television programs from being viewed, based on their ratings and content category. This feature enables parents to control what is viewable by children in their household.

Accessing the V-chip configuration page requires a 4-digit PIN (personal identification number). The default PIN is **0000**.

To configure the V-chip:

1. Select **V-Chip** from the left sidebar menu on the Control page.

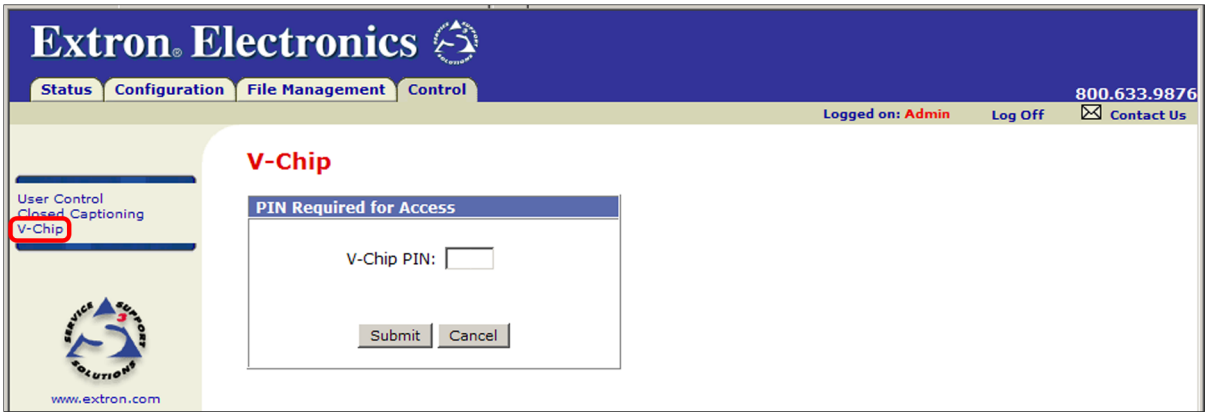



**Figure 58. V-Chip Page**

2. Enter the V-chip PIN number In the **V-Chip PIN** field. If no PIN has been assigned, enter the default **0000**.
3. Click **Submit**. The V-chip screen editing screen appears.

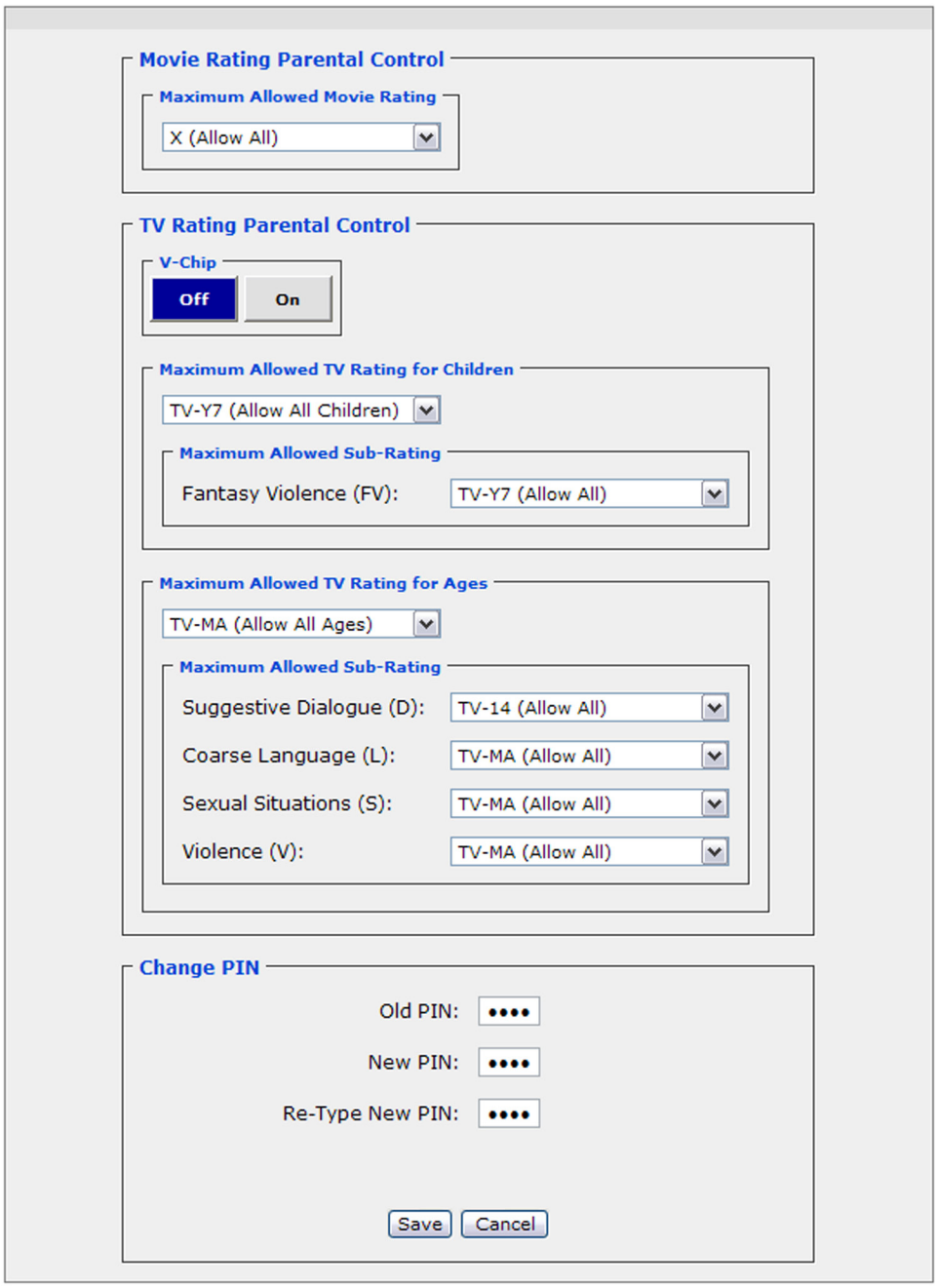
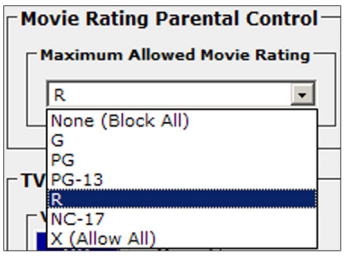



**Figure 59. V-chip Screen**

**4.** On the V-Chip screen, make adjustments as desired in the sections described below.

## Movie Rating Parental Control section




From the **`Maximum Allowed Moving Rating`** menu, select the level of movie ratings at which to begin blocking from view. The rating you select and all higher ratings will be blocked from view on your display. If you select **X**, movies with all ratings are allowed. If you select **None**, movies with all ratings are blocked (only unrated movies are shown).

In the example at right, **R** was selected. Movies with R and NC-17 ratings will be blocked.

## TV Rating Parental Control section

In this section, you can specify the highest rating level of television programs that will be shown. Programs with higher ratings than your selections are blocked. You can also select the sub-rating (category) of programs to be blocked.

This section contains the following sub-sections:

- **V-Chip:** To be able to specify program blocking, enable the V-chip by clicking the **On** button in this section. To disable the V-chip, click **Off**.

  **NOTE:** The Off button remains highlighted whether or not the V-chip is enabled.

- **Maximum Allowed TV Rating for Children:** From this menu, select the child-appropriate rating at which blocking will begin.

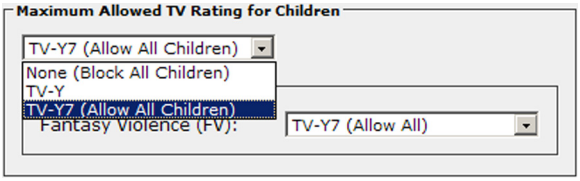



**Figure 60. Maximum Allowed TV Rating for Children Menu**

The ratings options are:

- **None (Block All Children):** All programs with ratings for children are blocked.
- **TV-Y:** Appropriate for children aged 0 through 6
- **TV-Y7 (Allow All Children):** Appropriate for children aged 7 and older. Applies to FV (fantasy violence) programs only.)

- **Maximum Allowed Sub-Rating** menu

  This menu applies only to programs with the FV (fantasy violence) rating. From it, you can select to either block (select **None**) or allow (select **TV-Y7**) all FV-rated shows.

## Maximum Allowed TV Rating for Ages section

From the Maximum Allowed TV Rating for Ages menu, you can select the rating level at which blocking of television shows will begin. The menu contains the following age options:

- **None (Block All Ages):** Programs with all rating levels are blocked. Only unrated shows are allowed.
- **TV-G:** General audiences
- **TV-PG:** Parental guidance suggested
- **TV-14:** Children age 14 and older
- **TV-MA (Allow All Ages):** Mature audiences (age 17 and older)

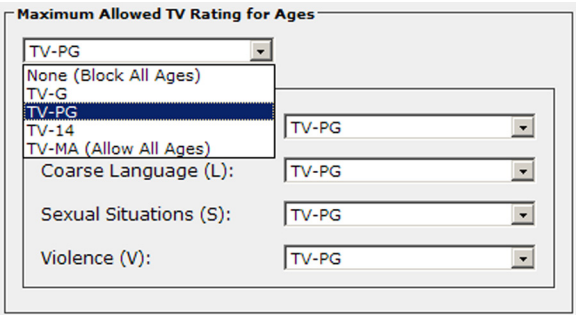



**Figure 61. Maximum Allowed Rating for Ages Menu**

The Maximum Allowed TV Rating for Ages section contains four submenus from which you can select blocking levels for shows containing the following:

**D:** Suggestive dialog

**B:** Coarse language

**S:** Sexual content

**V:** Violence

**NOTE:** Selections made from the submenus may affect the selection made from the main menu, and vice versa.

## Change PIN section

In this section, you can change the PIN number required for access to the V-chip configuration menus. The PIN must have 4 digits.

To change the V-chip access PIN:

1. In the **Old PIN** field, enter the current PIN. If no PIN has been set, enter the default **0000**. The number is masked by four bullets.
2. In the **New PIN** field, enter your new 4-digit PIN.
3. Reenter the new PIN in the **Re-Type New PIN** field.
4. Click **Save** to set the new PIN.

# Reference Information

This section provides reference information on the AVT 200HD. The following topics are covered:


- **Specifications**
- **Part Numbers and Accessories**
- **Mounting the Tuner**
- **IP Addressing**
- **Frequency Tables**


## Specifications

### RF video input

| | |
|---|---|
| Number/signal type | 1 radio frequency (RF) |
| Connector | 1 female F connector |
| Level | ATSC: -80 dBm to -5 dBm<br>Cable: -62 dBm to -32 dBm |
| Impedance | 75 ohms |
| Frequency range | 54 MHz to 863 MHz |
| ATSC channels | 2-69 |
| Cable channels | 1-135 (clear QAM channel) |

### Signal processing

| | |
|---|---|
| Video | ATSC 8-VSB demodulation<br>64/256 QAM demodulation<br>MPEG2 main profile high level video decoding |
| Audio | 5.1 channel Class A Dolby® Digital audio decoding<br>PCM audio decoding |

### Video output — analog

| | |
|---|---|
| Number/signal type | 1 RGBHV<br>1 component video<br>1 S-video<br>1 composite video |
| Connectors | 5 female BNC<br>3 female BNC<br>1 female 4-pin mini DIN<br>1 female BNC |
| Nominal level | 1 Vp-p for Y of component video and S-video, and for composite video<br>0.7 Vp-p for RGB and for R-Y and B-Y of component video<br>0.3 Vp-p for C of S-video |
| Minimum/maximum levels | 0 V to 1.0 Vp-p |
| Impedance | 75 ohms |

| | |
|---|---|
| Scaled resolution | 480i[1], 480p[1], 720p[2], 1080i[2]<br>[1] = at 59.94 Hz, [2] = at 60 Hz |
| DC offset | ±50 mV with input at 0 offset |

## Video output — digital

| | |
|---|---|
| Number/signal type | 1 single link HDMI with audio |
| Connector | 1 female HDMI type A |
| Scaled resolution | 480p[1], 720p[2], 1080i[2]<br>[1] = at 59.94 Hz, [2] = at 60 Hz |

## Sync

| | |
|---|---|
| Output type | RGBHV, bi-level and tri-level for component video |
| Output level | 2.75 V to 5.0 Vp-p for RGBHV<br>0.6 Vp-p for component video tri-level sync<br>0.3 Vp-p for component video bi-level sync |
| Output impedance | 75 ohms |
| Polarity | Negative (default) or positive, selectable |

## Audio output — analog

| | |
|---|---|
| Number/signal type | 1 balanced/unbalanced stereo<br>1 unbalanced stereo |
| Connectors | (1) 3.5 mm captive screw connector, 5 pole<br>1 pair of female RCA jacks |
| Impedance | 50 ohms unbalanced, 100 ohms balanced |
| Frequency response | 20 Hz to 20 kHz, ±0.5 dB |
| Gain error | ± 0.5 dB channel to channel |
| Nominal level | -10 dBV (316 mVrms), +4 dBu (1.23 Vrms) |
| Maximum level (Hi-Z) | +10 dBV (unbalanced), +18 dBu (balanced) |

## Audio output — digital

| | |
|---|---|
| Number/signal type | 2 S/PDIF (1 optical, 1 coaxial) |
| Formats | PCM, AC-3 (Dolby Digital 5.1) |
| Connectors | 1 TOSLINK™ fiber optic connector<br>1 RCA jack |

## Control/remote — tuner

**NOTE:** The front panel USB port and rear panel RS-232 port are independent of each other and can be used at the same time.

| | |
|---|---|
| Serial control port | 1 bidirectional RS-232, 3.5 mm captive screw connector, 5 pole (shared with wired IR control) |
| Baud rate and protocol | 115200, 38400, 19200, or 9600 baud (default); 8 data bits; 1 stop bit; no parity |
| Serial control pin configurations | 1 = Tx, 2 = Rx, 3 = GND, 4 = modulated IR, 5 = +12 VDC |
| USB control ports | 1 front panel female mini USB B |
| USB standards | USB 2.0, low speed |
| Ethernet control port | 1 RJ-45 female |
| Ethernet data rate | 10/100Base-T, half/full duplex with autodetect |
| Ethernet protocol | ARP, ICMP (ping), IP, TCP, DHCP, HTTP, SMTP, Telnet |
| Ethernet default settings | Link speed and duplex level = autodetected<br>IP address = 192.168.254.254<br>Subnet mask = 255.255.0.0<br>Default gateway = 0.0.0.0<br>DHCP = off |
| Web server | Up to 200 simultaneous sessions<br>7.25 MB nonvolatile user memory |

| | |
|---|---|
| IR remote control | AVT 200HD remote (optional)<br>Front panel: 30' maximum, 40 degrees off axis<br>Rear panel captive screw connector (shared with RS-232): 38 kHz, hardwired, modulated |
| Program control | Extron control/configuration program for Windows®<br>Extron Simple Instruction Set™ (SIS™)<br>Microsoft® Internet Explorer® ver. 6 or higher, Telnet |

## General

| | |
|---|---|
| Power | 100 VAC to 240 VAC, 50-60 Hz, 25 watts, internal |
| Temperature/humidity | Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing<br>Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing |
| Cooling | Convection, vents on top and sides |
| Mounting | |
| Rack mount | Yes, with included brackets |
| Furniture mount | Yes, with optional mounting kit |
| Enclosure type | Metal |
| Enclosure dimensions | 1.7" H x 17.5" W x 10.5" D (1U high, full rack wide)<br>(4.3 cm H x 44.4 cm W x 26.7 cm D)<br>(Depth excludes connectors.) |
| Product weight | 5.5 lbs (2.5 kg) |
| Shipping weight | 10 lbs (5 kg) |
| Vibration | ISTA 1A in carton (International Safe Transit Association) |
| Regulatory compliance | |
| Safety | CE, c-UL, UL |
| EMI/EMC | CE, C-tick, FCC Class A, ICES, VCCI |
| MTBF | 30,000 hours |
| Warranty | 3 years parts and labor |

**NOTES:** All nominal levels are at ±10%.

Specifications are subject to change without notice.

# Part Numbers and Accessories

## Included Parts

The following parts are provided with your AVT 200HD.

| Included Part | Replacement Part Number |
|---|---|
| AVT 200HD Tuner | 60-770-01 |
| Rubber feet (4) (not attached) | |
| US style IEC power cord | |
| AVT 200HD Control Software on DVD | |
| *AVT 200HD Setup Guide* | |
| 5-pin captive screw connector (2) | |
| LockIt HDMI Cable Lacing Bracket | 101-020-01 (package of 50) |
| *LockIt™ HDMI Lacing Bracket Installation Guide* | |
| MBD 149 rack mounting kit | 70-077-03 |

## Optional Accessories

The following optional accessories can be purchased for use with the AVT 200HD.

| Accessory | Part Number |
|---|---|
| AVT 200HD Remote Control | 70-743-01 |
| IR Link | 60-404-02, -03 |
| Mini USB B type to USB A type cable | 26-654-06 |

## Cables

The following control cables are recommended for use with the AVT 200HD:

| Cable | Part Number |
|---|---|
| UC50' Universal Control 50' (15.2 m) | 26-518-01 |
| UC100' Universal Control 100' (30.4 m) | 26-518-02 |
| CTL/1000 Comm-Link non-plenum 1000' (300 m) | 22-148-03 |
| CTLP/1000 Comm-Link plenum 1000' (300 m) | 22-119-03 |

# Mounting the Tuner

## UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the AVT into a rack:

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- **Reduced air flow** — Install the equipment in the rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- **Circuit overloading** — When connecting the equipment to the supply circuit, consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

## Rack Mounting Procedure

The AVT matrix switchers are housed in rack-mountable metal enclosures with mounting flanges for standard 19-inch racks. If desired, rack mount the AVT 200HD as follows:

1. Attach the included mounting brackets to the unit using eight of the machine screws provided with the mounting kit.
2. Insert the tuner into the rack, aligning the holes in the mounting brackets with those in the rack. Use four provided machine screws to attach the brackets to the rack.

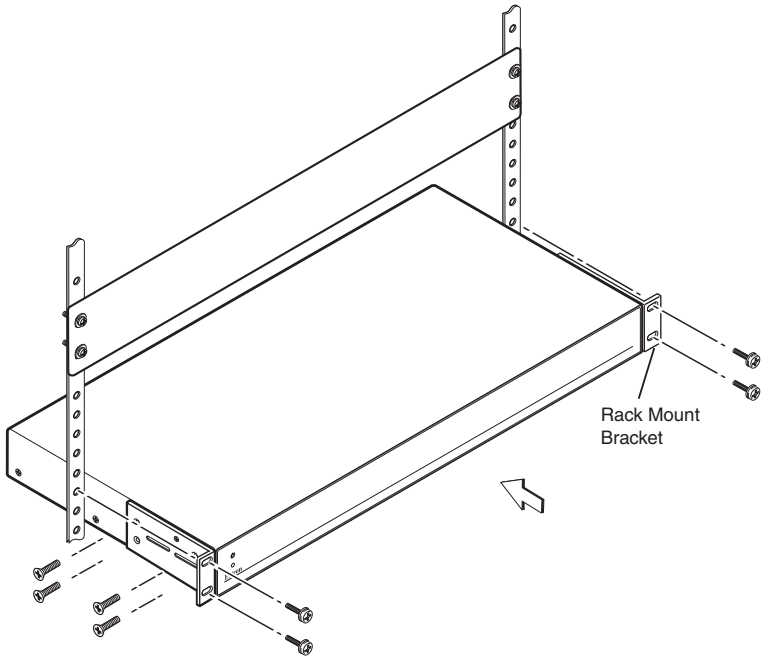



**Figure 62. Mounting the AVT 200HD to a 19-inch Rack**

# IP Addressing

## What is an IP Address?

An IP address is a 32-bit binary number that is used to identify each device on an Ethernet network. This number is usually represented by four decimal numbers (each in the range or 0 to 255) separated by dots, such as 198.123.34.240. This is called "dotted decimal notation."

An IP address is divided into two parts:

- Network identifier
- Host identifier

Each address on a given network must have the same network identifier value but have a unique host identifier. As a result, there are different classes of addresses the define the range of valid addresses and which parts of the address are used for the network and host identifiers.

The most common IP address classes are:

| Class Name | Valid Address Range | Identifier Arrangement |
|---|---|---|
| Class A | 0.0.0.1 to 127.255.255.254 | *NNN.HHH.HHH.HHH* |
| Class B | 128.0.0.1 to 191.255.255.254 | *NNN.NNN.HHH.HHH* |
| Class C | 192.0.0.1 to 223.255.255.254 | *NNN.NNN.NNN.HHH* |

*NNN* refers to the network identifier and *HHH* refers to the host identifier.

## Choosing IP Addresses

If the computer and the AVT are directly connected or connected via their own independent network, follow the guidelines below for choosing the IP addresses.

However, if you intend to connect your computer and tuner to an existing network, you need to advise the network administrator and ask the administrator to allocate suitable IP addresses.

On an independent network, it is generally recommended that you use the Class C format (from 192.0.0.1 to 223.255.255.254).

There are two rules for choosing IP addresses:

- Network identifier must be the same for each IP address
- Host identifier must be unique for each address.

Applying these rules to Class C addresses, the first three decimal values of your IP address must all be the same while the last value is used to uniquely identify each device.

The following is an example of a **valid** Class C addressing scheme:

| Device | IP Address |
|---|---|
| AVT 200HD Control Software Computer | 208.132.180.41 |
| AVT 200HD tuner | 208.132.180.42 |

**NOTE:** The host identifiers (41, 42, and 43 in the above example) do not need to be sequential or in any particular order. However, it is recommended that you group the numbers for simplicity.

The following is an example of an **invalid** Class C addressing scheme:

| Device | IP Address |
|---|---|
| AVT 200HD Control Software Computer | 208.132.180.41 |
| AVT 200HD tuner | 192.157.180.42 |

**NOTE:** The above addresses are invalid because the network identifier for each address is not the same even though each IP address is unique.

You can perform a test from your computer to check that a device at a particular address is responding correctly or to determine its address (see "**Pinging for the IP Address**").

## Subnet Mask

The subnet mask is another 32-bit binary number that is used to "mask" certain bits of the IP address. This provides a method of extending the number of network options for a given IP address. It works by allowing part of the host identifier to be used as a subnet identifier.

It is important that you set the correct value for the subnet mask. The basic values depend on the class of IP address being used.

| Class Name | Subnet Mask |
|---|---|
| Class A | 255.0.0.0 |
| Class B | 255.255.0.0 |
| Class C | 255.255.255.0 |

See "**Subnetting—A Primer**," later in this section, for more information.

## Pinging for the IP Address

To access the AVT 200HD via the Ethernet port, you need the tuner IP address. If the address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the Ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the AVT 200HD.

### Pinging to determine the Extron IP address

The Microsoft Ping utility is available at the command prompt. Ping tests the Ethernet interface between the computer and the AVT 200HD. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the tuner as follows:

1. From the Windows **Start** menu, select **Run...** . The Run window opens.
2. In the **Open** text field, enter `command`.
3. Click **OK**. A command window opens.
4. At the command prompt, enter `ping` *`IP address`*. The computer returns a display similar to the figure on the next page.

The line **Pinging ...** reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

**Figure 63. Ping Response**

### Pinging to determine the web IP address

The Ping utility has a modifier, **-a**, that directs the command to return the web address rather than the numeric IP address.

At the prompt, enter **ping -a** *IP address*. The display that the computer returns is similar to the **Ping** response shown in the figure above, except that when you specify the **-a** modifier, the line **Pinging mail...** reports the web IP address instead of the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

## Connecting as a Telnet Client

The Microsoft Telnet utility is available from the command prompt. Telnet allows you to input SIS commands to the AVT 200HD from the PC via the Ethernet link and the LAN.

Access the command prompt and start Telnet as follows:

1. From the **Start** menu, select **Run...**. The **Run** window opens.
2. In the **Open** text field, enter **command**.
3. Click **OK**. A command window opens.
4. At the prompt, enter **telnet**. The computer returns a display similar to the figure on the next page.

```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

**Figure 64. Telnet Screen**

## Telnet tips

It is not the intention of this guide to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the AVT 200HD via Telnet.

### *Connecting to the AVT (Open command)*

You connect to the AVT Plus tuner using the `Open` command. After your computer is connected to the tuner, you can enter the SIS commands the same as you would if you were using the RS-232 link.

Connect to the AVT as follows:

1. At the Telnet prompt, enter `open IP address`.
   - **If the tuner is not password protected**, no further prompts are displayed until you disconnect from the AVT 200HD.
   - **If the tuner is password protected**, Telnet displays the password prompt.
2. If necessary, enter the password at the password prompt.

   Connection to the tuner via the Ethernet can be password protected. There are two levels of password protection: administrator and user.
   - A person logged on as an administrator has full access to all AVT switching capabilities and editing functions.
   - Users can closed captioning on and off, mute or unmute the output, select the channel or preset, and view all settings with the exception of passwords. By default, the tuner is delivered with both passwords set to empty.

   When you are logged in, the tuner returns either `Login Administrator` or `Login User`. No further prompts are displayed until you disconnect from the AVT 200HD.

### *Escape character and Esc key*

Many SIS commands include the keyboard <Esc> key. Consequently, some confusion may exist between the `Escape` character and the <Esc> key.

When Telnet is first started, the utility advises that the `Escape character is "Ctrl+]."` This means that the Telnet `Escape` character is a key combination: the <Ctrl> key and the **<**]> key pressed simultaneously. Pressing these keys displays the Telnet prompt while leaving the connection to the AVT 200HD intact.

### *Local echo*

Once your computer is connected to the AVT 200HD, by default Telnet does not display your keystrokes on the screen. SIS commands are entered blindly, and only the SIS responses are displayed on the screen. To command Telnet to show all keystrokes, enter `set local_echo` at the Telnet prompt before you open the connection to the tuner.

With local echo turned on, keystrokes and the tuner responses are displayed on the same line.

**Example:** `1*1!In1 Out1 All`,

where `1*1!` is the SIS command and `In1 Out1 All` is the response.

Note that all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as `a*d*m*i*n*`, where `admin` is the keyed-in password and `*****` is the masked response.

Local echo can be turned off by entering `unset local_echo` at the Telnet prompt. If your computer is connected to the AVT 200HD, and you need to access the Telnet prompt to turn local echo off, enter the `Escape` sequence (<Ctrl + ]>).

### *Setting carriage return-line feed*

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected tuner when you press the <Enter> key. This is the correct setting for SIS communication with the tuner. The Telnet `set crlf` command forces Telnet to transmit carriage return and line feed characters when <Enter> is pressed; however, if `crlf` is set, the SIS link with the tuner does not function properly.

### *Closing the link to the tuner*

To close the link to the tuner, access the Telnet prompt by entering the escape sequence (<Ctrl + ]>). At the Telnet prompt, enter `close`.

### *Help*

For Telnet command definitions, enter `?` at the Telnet prompt.

### *Exiting Telnet (Quit command)*

Exit the Telnet utility by entering `quit` at the Telnet prompt. If you are connected to the AVT 200HD, access the Telnet prompt by entering the Escape sequence (<Ctrl + ]>).

## Subnetting — A Primer

A subnet is a **sub**set of a **net**work — a set of IP devices that have portions of their IP addresses in common. It is not the purpose of this manual to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting is necessary in order to understand the interaction of the AVT 200HD and the mail server gateway. To understand subnetting at the level required to install and operate the AVT 200HD, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

### Gateways

The AVT 200HD can communicate with the e-mail server that it uses for e-mail notification directly (if they are on the same subnet), or the communication can be routed via a gateway (a computer that provides a link between different subnets).

### Local and remote devices

The local and remote devices are defined from the point of view of the function being described. In this guide, subnetting is an issue when you are using the controlling computer to set TCP/IP values in the AVT 200HD (see "**Establishing an Ethernet Connection**" in the "Remote Configuration and Control" section).

### IP addresses and octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric sub-fields, called "octets," which are separated by dots (periods) (figure 65). Each octet can be numbered from 000 through 255. Leading zeros, up to three digits total per octet, are optional. Values of 256 and above are invalid.

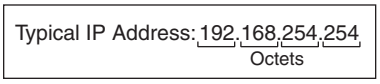



**Figure 65. IP Address and Octets**

## Subnet masks and octets

The subnet mask (figure 66) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeros, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

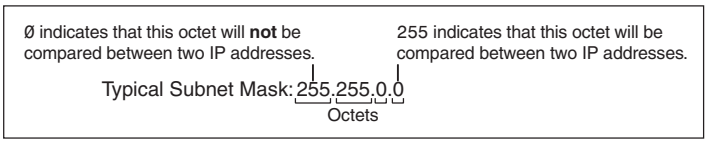

Ø indicates that this octet will **not** be compared between two IP addresses.
255 indicates that this octet will be compared between two IP addresses.
Typical Subnet Mask: 255.255.0.0
Octets

**Figure 66. Subnet Mask and Octets**

## Determining whether devices are on the same subnet

To determine the subnet, the local device IP address is compared to the remote device IP address (see figure 67, below). The octets of each address are compared or not, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the local device address and the remote device IP address are unmasked.

  **Unmasked octets are compared** (indicated by ***?*** in figure 67).

- If the subnet mask octet contains the value 0, the related octets of the local device and remote device IP addresses are masked.

  **Masked octets are not compared** (indicated by ***X*** in figure 67).

If the unmasked octets of the two IP addresses **match** (indicated by **=** in example 1 of the figure below), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by an unequal sign in the figure below, examples 2 and 3), the addresses **are not on the same subnet**.

| | **Example 1** | **Example 2** | **Example 3** |
|---|---|---|---|
| Local IP Address: | 192.168.254.254 | 192.168.254.254 | 192.168.254.254 |
| Subnet Mask: | 255.255.0.0 (*?.?.X.X)* | 255.255.0.0 (*?.?.X.X)* | 255.255.0.0 (*?.?.X.X)* |
| Remote IP Address: | 192.168.2.25 | 190.190.2.25 | 192.190.2.25 |
| Match?: | =.=.*X.X* — **Match** (Same subnet) | ≠.≠.*X.X* — **No match** (Different subnet) | =.≠.*X.X* — **No match** (Different subnet) |

**Figure 67. Comparing the IP Addresses**

# Frequency Tables

The following tables list all the ATSC (over-the-air) and cable channels that are available through the AVT 200HD.

## ATSC Frequency Table

| Physical Channel | Lower Edge | Video Carrier | ATSC Carrier | Audio Carrier | Upper Edge |
|---|---|---|---|---|---|
| 2 | 54 | 55.25 | 54.31 | 59.75 | 60 |
| 3 | 60 | 61.25 | 60.31 | 65.75 | 66 |
| 4 | 66 | 67.25 | 66.31 | 71.75 | 72 |
| 5 | 76 | 77.25 | 76.31 | 81.75 | 82 |
| 6 | 82 | 83.25 | 82.31 | 87.75 | 88 |
| 7 | 174 | 175.25 | 174.31 | 179.75 | 180 |
| 8 | 180 | 181.25 | 180.31 | 185.75 | 186 |
| 9 | 186 | 187.25 | 186.31 | 191.75 | 192 |
| 10 | 192 | 193.25 | 192.31 | 197.75 | 198 |
| 11 | 198 | 199.25 | 198.31 | 203.75 | 204 |
| 12 | 204 | 205.25 | 204.31 | 209.75 | 210 |
| 13 | 210 | 211.25 | 210.31 | 215.75 | 216 |
| 14 | 470 | 471.25 | 470.31 | 475.75 | 476 |
| 15 | 476 | 477.25 | 476.31 | 481.75 | 482 |
| 16 | 482 | 483.25 | 482.31 | 487.75 | 488 |
| 17 | 488 | 489.25 | 488.31 | 493.75 | 494 |
| 18 | 494 | 495.25 | 494.31 | 499.75 | 500 |
| 19 | 500 | 501.25 | 500.31 | 505.75 | 506 |
| 20 | 506 | 507.25 | 506.31 | 511.75 | 512 |
| 21 | 512 | 513.25 | 512.31 | 517.75 | 518 |
| 22 | 618 | 519.25 | 618.31 | 523.75 | 524 |
| 23 | 524 | 525.25 | 524.31 | 539.75 | 530 |
| 24 | 530 | 531.25 | 530.31 | 535.75 | 536 |
| 25 | 536 | 537.25 | 536.31 | 541.75 | 542 |
| 26 | 542 | 543.25 | 542.31 | 547.75 | 548 |
| 27 | 548 | 549.25 | 548.31 | 553.75 | 554 |
| 28 | 554 | 555.25 | 554.31 | 559.75 | 560 |
| 29 | 560 | 561.25 | 560.31 | 565.75 | 566 |
| 30 | 566 | 567.25 | 566.31 | 571.75 | 572 |
| 31 | 572 | 573.25 | 572.31 | 577.75 | 578 |
| 32 | 578 | 579.25 | 578.31 | 583.75 | 584 |
| 33 | 584 | 585.25 | 584.31 | 589.75 | 590 |
| 32 | 590 | 591.25 | 590.31 | 595.75 | 596 |
| 35 | 596 | 597.25 | 596.31 | 601.75 | 602 |

## ATSC Frequency Table (continued)

| Physical Channel | Lower Edge | Video Carrier | ATSC Carrier | Audio Carrier | Upper Edge |
|---|---|---|---|---|---|
| 36 | 602 | 603.25 | 602.31 | 607.75 | 608 |
| 37* | 608 | 609.25 | – | 613.75 | 614 |
| 38 | 614 | 615.25 | 614.31 | 619.75 | 620 |
| 39 | 620 | 621.25 | 620.31 | 625.75 | 626 |
| 40 | 626 | 627.25 | 626.31 | 631.75 | 632 |
| 41 | 632 | 633.25 | 632.31 | 637.75 | 638 |
| 42 | 638 | 639.25 | 638.31 | 643.75 | 644 |
| 43 | 644 | 645.25 | 644.31 | 649.75 | 650 |
| 44 | 650 | 651.25 | 650.31 | 655.75 | 656 |
| 45 | 656 | 657.25 | 656.31 | 661.75 | 662 |
| 46 | 662 | 663.25 | 662.31 | 667.75 | 668 |
| 47 | 668 | 669.25 | 668.31 | 673.75 | 674 |
| 48 | 670 | 675.25 | 670.31 | 679.75 | 680 |
| 49 | 680 | 681.25 | 680.31 | 685.75 | 686 |
| 50 | 686 | 687.25 | 686.31 | 691.75 | 692 |
| 51 | 692 | 693.25 | 692.31 | 697.75 | 698 |
| 52 | 698 | 699.25 | 698.31 | 703.75 | 704 |
| 53 | 704 | 705.25 | 704.31 | 709.75 | 710 |
| 54 | 710 | 711.25 | 710.31 | 715.75 | 716 |
| 55 | 716 | 717.25 | 716.31 | 721.75 | 722 |
| 56 | 722 | 723.25 | 722.31 | 727.75 | 728 |
| 57 | 728 | 729.25 | 728.31 | 733.75 | 734 |
| 58 | 734 | 735.25 | 734.31 | 739.75 | 740 |
| 59 | 740 | 741.25 | 740.31 | 745.75 | 746 |
| 60 | 746 | 747.25 | 746.31 | 751.75 | 752 |
| 61 | 752 | 753.25 | 752.31 | 757.75 | 758 |
| 62 | 758 | 759.25 | 758.31 | 763.75 | 764 |
| 63 | 764 | 765.25 | 764.31 | 769.75 | 770 |
| 64 | 770 | 771.25 | 770.31 | 775.75 | 776 |
| 65 | 776 | 777.25 | 776.31 | 781.75 | 782 |
| 66 | 782 | 783.25 | 782.31 | 787.75 | 788 |
| 67 | 788 | 789.25 | 788.31 | 793.75 | 794 |
| 68 | 794 | 795.25 | 794.31 | 799.75 | 800 |
| 69 | 800 | 801.25 | 800.31 | 805.75 | 806 |

*****Channel 37 frequency does not apply to ATSC broadcasting.

## Cable Frequency Table

| Physical Channel | Visual Carrier Frequency (MHz) | | |
|---|---|---|---|
| | Standard Cable | IRC Cable | HRC Cable |
| 2 | 55.25 | 55.25 | 54 |
| 3 | 61.25 | 61.25 | 60 |
| 4 | 67.25 | 67.25 | 66 |
| 5 | 77.25 | 79.25 | 78 |
| 6 | 83.25 | 85.25 | 84 |
| 7 | 175.25 | 175.25 | 174 |
| 8 | 181.25 | 181.25 | 180 |
| 9 | 187.25 | 187.25 | 186 |
| 10 | 193.25 | 193.25 | 192 |
| 11 | 199.25 | 199.25 | 198 |
| 12 | 205.25 | 205.25 | 204 |
| 13 | 211.25 | 211.25 | 210 |
| 14 | 121.25 | 121.25 | 120 |
| 15 | 127.25 | 127.25 | 126 |
| 16 | 133.25 | 133.25 | 132 |
| 17 | 139.25 | 139.25 | 138 |
| 18 | 145.25 | 145.25 | 144 |
| 19 | 151.25 | 151.25 | 150 |
| 20 | 157.25 | 157.25 | 156 |
| 21 | 163.25 | 163.25 | 162 |
| 22 | 169.25 | 169.25 | 168 |
| 23 | 217.25 | 217.25 | 216 |
| 24 | 223.25 | 223.25 | 222 |
| 25 | 229.25 | 229.25 | 228 |
| 26 | 239.25 | 239.25 | 234 |
| 27 | 241.25 | 241.25 | 240 |
| 28 | 247.25 | 247.25 | 246 |
| 29 | 253.25 | 253.25 | 252 |
| 30 | 259.25 | 259.25 | 258 |
| 31 | 265.25 | 265.25 | 264 |
| 32 | 271.25 | 271.25 | 270 |
| 33 | 277.25 | 277.25 | 276 |
| 34 | 283.25 | 283.25 | 282 |
| 35 | 289.25 | 289.25 | 288 |
| 36 | 295.25 | 295.25 | 294 |
| 37 | 304.25 | 304.25 | 300 |
| 38 | 307.25 | 307.25 | 306 |
| 39 | 313.25 | 313.25 | 312 |

## Cable Frequency Table (continued)

| Physical Channel | Visual Carrier Frequency (MHz) | | |
|---|---|---|---|
| | Standard Cable | IRC Cable | HRC Cable |
| 40 | 319.25 | 319.25 | 318 |
| 41 | 325.25 | 325.25 | 324 |
| 42 | 331.25 | 331.25 | 330 |
| 43 | 337.25 | 337.25 | 336 |
| 44 | 343.25 | 343.25 | 342 |
| 45 | 349.25 | 349.25 | 348 |
| 46 | 355.25 | 355.25 | 354 |
| 47 | 361.25 | 361.25 | 360 |
| 48 | 367.25 | 367.25 | 366 |
| 49 | 373.25 | 373.25 | 372 |
| 50 | 379.25 | 379.25 | 378 |
| 51 | 285.25 | 285.25 | 384 |
| 52 | 391.25 | 391.25 | 390 |
| 53 | 397.25 | 397.25 | 396 |
| 54 | 403.25 | 403.25 | 402 |
| 55 | 409.25 | 409.25 | 408 |
| 56 | 415.25 | 415.25 | 414 |
| 57 | 421.25 | 421.25 | 420 |
| 58 | 427.25 | 427.25 | 426 |
| 59 | 433.25 | 433.25 | 432 |
| 60 | 439.25 | 439.25 | 438 |
| 61 | 445.25 | 445.25 | 444 |
| 62 | 451.25 | 451.25 | 450 |
| 63 | 457.25 | 457.25 | 456 |
| 64 | 463.25 | 463.25 | 463 |
| 65 | 469.25 | 469.25 | 468 |
| 66 | 475.25 | 475.25 | 474 |
| 67 | 481.25 | 481.25 | 480 |
| 68 | 487.25 | 487.25 | 486 |
| 69 | 493.25 | 493.25 | 492 |
| 70 | 499.25 | 499.25 | 498 |
| 71 | 505.25 | 505.25 | 504 |
| 72 | 511.25 | 511.25 | 510 |
| 73 | 517.25 | 517.25 | 516 |
| 74 | 523.25 | 523.25 | 522 |
| 75 | 529.25 | 529.25 | 528 |
| 76 | 535.25 | 535.25 | 534 |
| 77 | 541.25 | 541.25 | 540 |

## Cable Frequency Table (continued)

| Physical Channel | Visual Carrier Frequency (MHz) | | |
|---|---|---|---|
| | Standard Cable | IRC Cable | HRC Cable |
| 78 | 547.25 | 547.25 | 546 |
| 79 | 553.25 | 553.25 | 552 |
| 80 | 559.25 | 559.25 | 558 |
| 81 | 565.25 | 565.25 | 564 |
| 82 | 571.25 | 571.25 | 570 |
| 83 | 577.25 | 577.25 | 576 |
| 84 | 583.25 | 583.25 | 582 |
| 85 | 589.25 | 589.25 | 588 |
| 86 | 595.25 | 595.25 | 594 |
| 87 | 601.25 | 601.25 | 600 |
| 88 | 607.25 | 607.25 | 606 |
| 89 | 613.25 | 613.25 | 612 |
| 90 | 619.25 | 619.25 | 618 |
| 91 | 625.25 | 625.25 | 624 |
| 92 | 631.25 | 631.25 | 630 |
| 93 | 637.25 | 637.25 | 636 |
| 94 | 643.25 | 643.25 | 642 |
| 95 | 91.25 | 91.25 | 90 |
| 96 | 97.25 | 97.25 | 96 |
| 97 | 103.25 | 103.25 | 102 |
| 98 | 109.25 | 109.25 | 108 |
| 99 | 115.25 | 115.25 | 114 |
| 100 | 649.25 | 649.25 | 648 |
| 101 | 655.25 | 655.25 | 654 |
| 102 | 661.25 | 661.25 | 660 |
| 103 | 667.25 | 667.25 | 666 |
| 104 | 673.25 | 673.25 | 672 |
| 105 | 679.25 | 679.25 | 678 |
| 106 | 685.25 | 685.25 | 684 |
| 107 | 691.25 | 691.25 | 690 |
| 108 | 697.25 | 697.25 | 696 |
| 109 | 703.25 | 703.25 | 702 |
| 110 | 709.25 | 709.25 | 708 |
| 111 | 715.25 | 715.25 | 714 |
| 112 | 721.25 | 721.25 | 720 |
| 113 | 727.25 | 727.25 | 726 |
| 114 | 733.25 | 733.25 | 732 |
| 115 | 739.25 | 739.25 | 738 |

## Cable Frequency Table (continued)

| Physical Channel | Visual Carrier Frequency (MHz) | | |
|---|---|---|---|
| | Standard Cable | IRC Cable | HRC Cable |
| 116 | 745.25 | 745.25 | 744 |
| 117 | 751.25 | 4556.75 | 750 |
| 118 | 757.25 | 4592.75 | 756 |
| 119 | 763.25 | 4628.75 | 762 |
| 120 | 769.25 | 4664.75 | 768 |
| 121 | 775.25 | 4700.75 | 774 |
| 122 | 781.25 | 4736.75 | 780 |
| 123 | 787.25 | 4772.75 | 786 |
| 124 | 793.25 | 4808.75 | 792 |
| 125 | 799.25 | 4844.75 | 798 |
| 126 | 805.25 | 4880.75 | 804 |
| 127 | 811.25 | 4916.75 | 810 |
| 128 | 871.25 | 4952.75 | 816 |
| 129 | 823.25 | 4988.75 | 822 |
| 130 | 829.25 | 5024.75 | 828 |
| 131 | 835.25 | 5060.75 | 834 |
| 132 | 841.25 | 5096.75 | 840 |
| 133 | 847.25 | 5132.75 | 846 |
| 134 | 853.25 | 5168.75 | 852 |
| 135 | 859.25 | 5204.75 | 858 |

# Extron® Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America, and Central America:**
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

**Japan:**
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

**Europe, Africa, and the Middle East:**
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

**China:**
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

**Asia:**
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

**Middle East:**
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This begins the repair process.

**USA**: (714) 491-1500 **Europe**: +31.33.453.4040
**Asia**: +65.6383.4400 **Japan**: +81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

| Extron **USA - West** Headquarters | Extron **USA - East** | Extron **Europe** | Extron **Asia** | Extron **Japan** | Extron **China** | Extron **Middle East** |
|---|---|---|---|---|---|---|
| **+800.633.9876** Inside USA/Canada Only | **+800.633.9876** Inside USA/Canada Only | **+800.3987.6673** Inside Europe Only | **+800.7339.8766** Inside Asia Only | **+81.3.3511.7655** | **+400.883.1568** Inside China Only | **+971.4.2991800** |
| **+1.714.491.1500** **+1.714.491.1517** FAX | **+1.919.863.1794** **+1.919.863.1797** FAX | **+31.33.453.4040** **+31.33.453.4050** FAX | **+65.6383.4400** **+65.6383.4664** FAX | **+81.3.3511.7656** FAX | **+86.21.3760.1568** **+86.21.3760.1566** FAX | **+971.4.2991880** FAX |

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